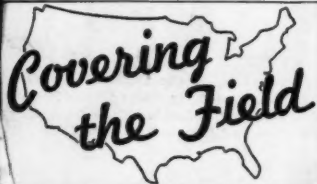


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Contractors *and* Engineers Monthly

Vol. 48, No. 1

JANUARY, 1951



Outlook for 1951

Chiefs of AGC, ARBA, the USBR, and Engineers gage construction volume and trends during the year ahead. Page 3.

Difficult Tunneling

Why difficult? Heavy ground, excessive water, and massive quartzite. Bracing was vital. Story on page 5.

New Concrete-Paving Finisher

Contractor Jim Baltes introduced it on a 6.4-mile dual-highway job in Ohio. Details are in the field story on page 11.

Meetings Here and There

In Louisville, MacDonald told the AASHTO to back road claims with facts. Ray of Ky. was elected President. Page 16. A "Man on the Land" movement gathered momentum at the National Reclamation Association meeting in Spokane. Page 17.

Thunder on the Left out of Korea reverberated at the AASHTO meeting in Miami. Keynote—transportation in crisis. Anderson was elected President. Page 93.

New Buildings

A big annex to relieve the shortage of office space in a state capitol building has an RC foundation to rock, supporting a structural-steel framework. Floors are cellular steel and concrete. Page 18.

The Ford foundry and engine plant described on page 63 has bell-type caisson foundations which were constructed economically with earth augers.

Airport Runway, Access Road

Page 35 describes grading, drainage, bitumacadam base work, and hot-mix paving at Beaver County Airport, Pa.

Hungry Horse Dam

On page 40, see and read about concrete placing at the world's third-highest dam. Of special interest, the use of pozzolan.

Canal Filled for Road

Shells dredged from a lake serve as fill for a canal; the filled-in canal will become an expressway. Page 48.

Status of Roadside Development

A C&E Monthly survey on page 52 reveals steady growth for roadside development across the nation; samples activities.

Bituminous Paving

Crusher and asphalt-plant setups, flexible-base work, and irregular transitions are part of the story on page 58.

County Pays as It Goes

A sand-asphalt job typical of this county's betterment program is covered on page 62. See, also, use of aerial maps.

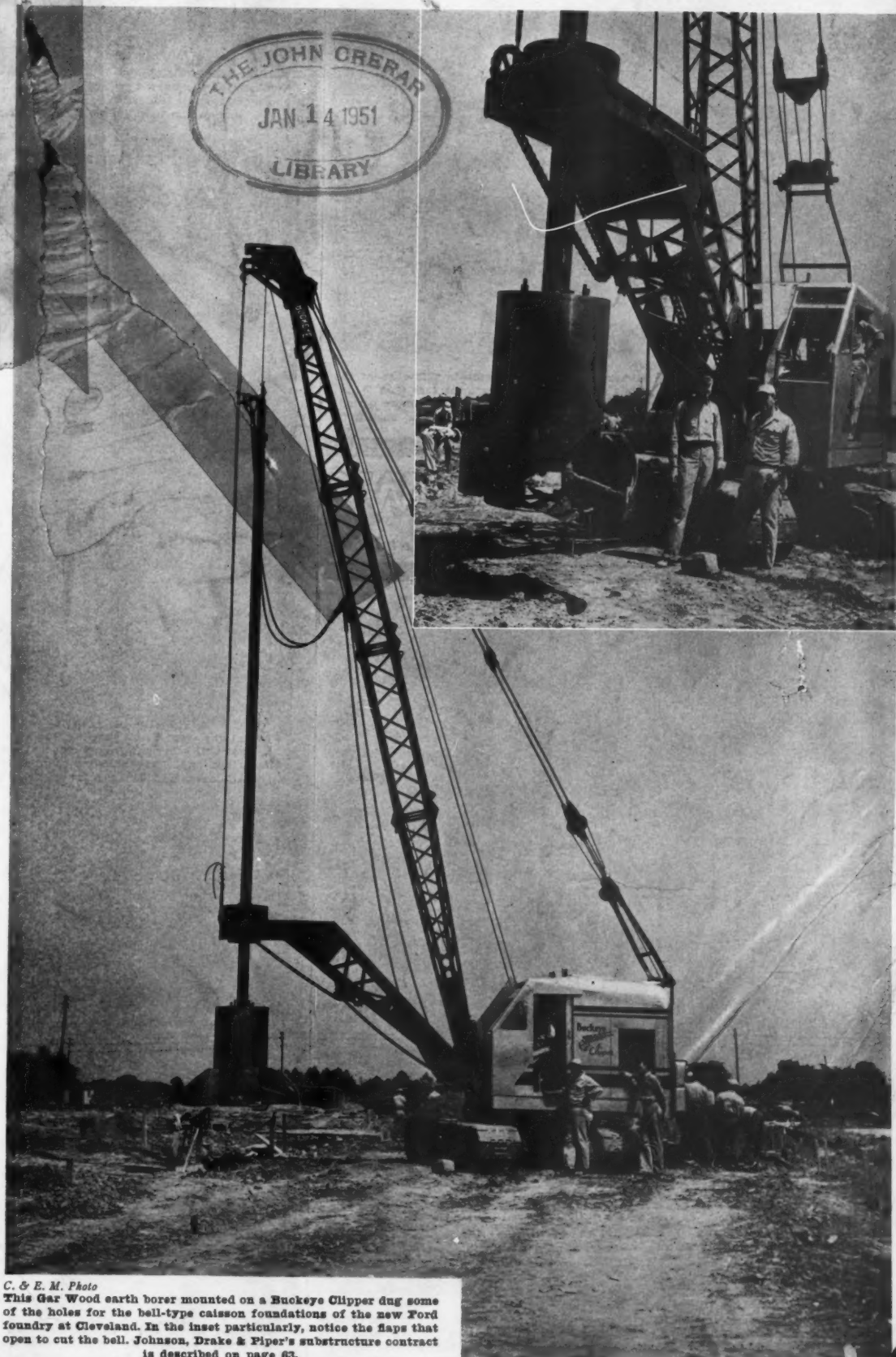
Caissons Sunk for Bridge

Six of them were towed into position and sunk, as concrete was placed in 9-foot lifts. Story and pictures, page 74.

Culverts Were Precast

Pictures on page 92 tell how box culverts were precast, using a vacuum process; were hauled to the site; and were lowered into special subgrade.

You will find "In This Issue" on page 4)



C. & E. M. Photo

This Gar Wood earth borer mounted on a Buckeye Clipper dug some of the holes for the bell-type caisson foundations of the new Ford foundry at Cleveland. In the inset particularly, notice the flaps that open to cut the bell. Johnson, Drake & Piper's substructure contract is described on page 63.

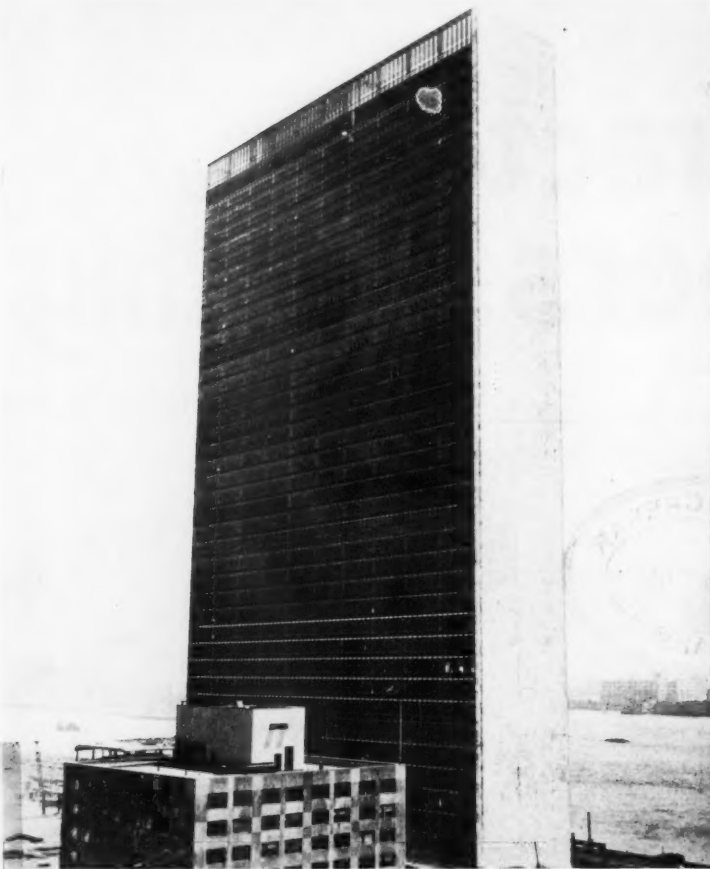


Photo Courtesy of Owens-Corning Fiberglas Corp.

The start of each new year prompts a backward look at the old—in this case, at the outstanding building project of 1950: the United Nations Secretariat (see C. & E. M., Jan. and Feb., 1950, pages 5 and 64). As 1950 brought greater stature and more permanent status to the U. N., so it brought a towering permanent home in New York City.

NEWS AND VIEWS

of the construction industry—a backward look at 1950

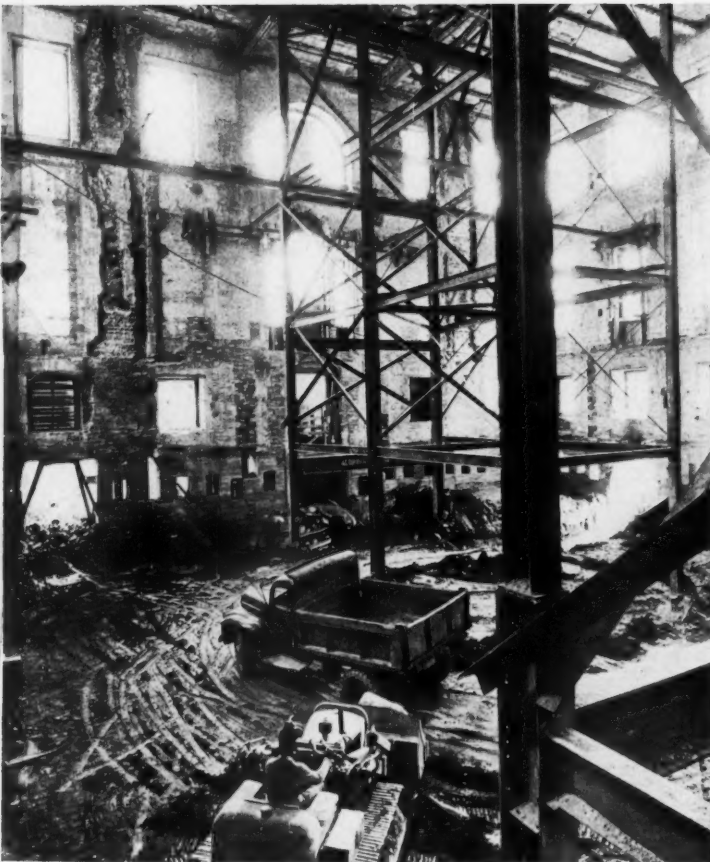


Photo by Abbie Rowe, Courtesy National Park Service

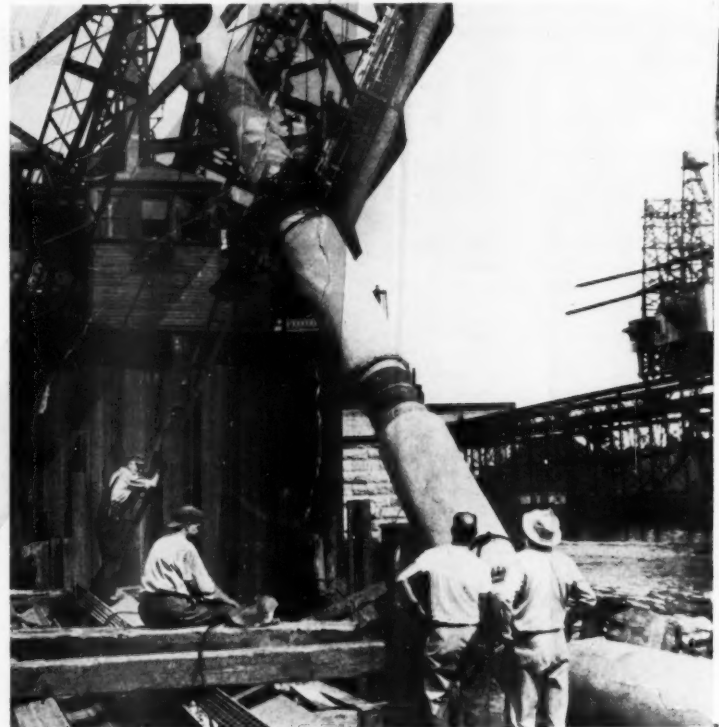
Easily the most interesting building restoration job of '50 was on our own White House. Allis-Chalmers HD-5G's tread lightly, for in the debris have appeared historical mementos—clay bricks baked in 1792, old timbers scarred by the 1814 British Redcoat fire, and a box containing 1902 Washington newspapers and a bottle of rye.



Defense installations were part of the \$22.8 billion of new construction during the first 10 months of 1950—here a Navy radar station near Arlington, Wash. A Lorain Back digger powered by a Caterpillar diesel excavates for the foundation.



Symbolic of the know-how America shared with other countries during 1950 is this photo of Japanese leaders in the Office of the Chief of Army Engineers during a 45-day tour of the U. S., including its river-and-harbor and flood-control work.



Natural gas from Texas reached Brooklyn in '50. Here is one of the last links in the line that will bring gas from Transcontinental Gas Pipe Line Corp. to utilities serving Manhattan and surrounding boroughs. Merritt-Chapman & Scott's steam derricks Colossus and Monarch lowered this section into Newton Creek, Brooklyn.



Training of AGC-sponsored Affiliated Units in the Organized Reserve Corps proceeded rapidly in 1950. Here members of the 423rd Engineer Construction Battalion, sponsored by the Cincinnati AGC, float a bridge section into place near Fort Belvoir, Va.



Crippling snows at the end of '50 warned that home fronts too need their defenders, come war or peace. With a milk truck hugging its tail, a Cat D8 owned by Lombardo Construction Co. clears snow in Cleveland, one of the worst-hit areas.

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Construction Outlook In This Year Ahead

Chiefs of AGC, the Corps of Engineers, the USBR, and The ARBA Offer Their Best Guesses on Volume, Trends

WE have it on the best authority that crystal balls clutter the city dump these days. Korea, China, Russia, mobilization, controls, and shortages have clouded the glass—none too clear at best—and made it worthless. Yet never has our need been more acute for some trustworthy evaluation of the future, some reliable suggestions on how to go about our business day by day in the year ahead.

Accordingly, C&E Monthly has queried four construction-industry chiefs—Walter L. Couse, President of the Associated General Contractors of America . . . Major General Lewis A. Pick, Chief of Engineers . . . L. N. McClellan, Chief Engineer of the Bureau of Reclamation . . . and Colonel E. R. Needles, President of the American Road Builders' Association. We believe that a symposium of these men's best guesses as to the 1951 outlook will be more helpful than all the crystal balls, polls, and indices on the market.

Couse, of the AGC

"There is nothing to support the belief that construction will languish should the war continue," says Mr. Couse. As in World War II, there may be a lull during the changeover from peacetime to wartime work, but it will be a less noticeable lull than before, we may "suppose a continuation in an abnormally high building volume during the coming year."

In 1951, the volume of defense construction from appropriations now made will not exceed \$2,000,000,000. So much of future appropriations will for defense will depend, of course, on war developments.

During the first ten months of 1950, Mr. Couse, new construction valued at \$22,800,000,000 was put in place. An construction contributed much to the total volume which exceeded comparable period in 1949 by \$4,100,000,000.

Construction volume is already being somewhat limited, directly and indirectly by the Government. Order M-4, issued last October by the National Production Authority, directly prohibits starts on projects for amusement and recreational purposes. As this order was originally phrased, construction already started could be halted "even though its commencement at the present time was not prohibited." But through the efforts of the AGC and others, the threat of summary halt has been amended out of the order. The NPA can, of course, halt starts on other types of construction when necessary. At present there is no machinery, as there was in the last war, for securing official approval of projects in prohibited categories.

Indirect control has been clamped on construction volume through restricted real-estate credit. Regulation X of the Federal Reserve Board requires larger down payments over a short period of time, to cut housing starts in 1951 to 100,000 units. Credit may be tightened, too, on rental housing and commercial building.

What of materials, labor, and wages? The present plan, Mr. Couse notes, is to channel most materials to defense and essential civilian construction by rigid control of a few key materials—steel, copper, zinc, nickel, etc. As for manpower, the Office of Defense Manpower has been created and a director

named, but no action has been announced at this writing. The nine members of the Wage Stabilization Board, representing the public, have been sworn in and have held their first meet-

ing. Two men familiar with construction problems are on this board—J. T. Dunlop, Chairman of the National Joint Board for the Settlement of Jurisdictional Disputes, and H. C. Bates, President of the Bricklayers' Union. If wage controls become necessary, a board similar to the old Wage Adjustment Board will probably be set up.

Finally, Mr. Couse has this bit of advice for contractors. In preparation for what may come, bring your financial statements and performance records up

to date. File them with the field offices of Government agencies in the areas in which you wish to operate. Only for large and secret operations will construction contracts be negotiated in Washington.

Pick, of the Engineers

Major General Lewis Pick seconds Mr. Couse's advice and sketches the procedure to follow in applying for Corps of Engineers work. First, as to

(Continued on page 88)



Route 301, North Carolina, before construction of new Texaco Asphalt surface.

North Carolina tops worn highway with 25 miles of Texaco



Laying the first of two courses of plant-mixed Texaco Asphalt Concrete.

Old pavement with tack coat of Cutback Asphalt (right); first course of Asphalt Concrete (left).



Contractor: Adams and Tate Construction Company of Roanoke, Va.

Route 301 is one of North Carolina's principal north-south highways, a popular route with many Florida-bound motorists. Last summer, a 25-mile section of this highway south of Fayetteville had deteriorated to the point that some type of improvement became imperative.

The method used by North Carolina to modernize this busy highway is economical, causes minimum inconvenience to traffic and gives the old, worn pavement a new, durable, joint-free wearing surface. Following a light tack coat of Texaco Rapid-Curing Cutback Asphalt, a resilient, heavy-duty Texaco Asphalt Concrete pavement was constructed in two courses with a combined thickness of 3 inches. The 85-100 penetration asphalt used in the asphaltic concrete mix also was used as a tack coat between the two courses.

In North Carolina and throughout the rest of the country east of the Rockies, road builders have been constructing and maintaining streets and highways with Texaco Asphalt products for over 45 years. Refined from selected crudes, this complete family of Asphalt Cements, Cutback Asphalts and Slow-Curing Asphaltic Oils includes a product exactly suited to each road and street need.

Two helpful booklets which describe all types of Asphalt construction can be secured without charge by writing our nearest office.



Note the volume and type of traffic which is served by this State highway.



Completed Texaco Asphalt Concrete pavement provides smooth, durable, skid-resistant riding surface.



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Contractors and Engineers Monthly

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For the Highway and Heavy-Construction Industry

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Time for a Realistic Appraisal

One of the most thorough, soul-searching self-examinations ever made is due in the construction business if that industry is to command continued respect. This is especially true on public works financed wholly or in part by taxes. The United States, faced with the responsibility of maintaining powerful armed forces for decades, perhaps, cannot and must not spend its financial strength on luxury projects whose conception in these critical times is unwise.

The Bureau of Reclamation's Central Arizona Project always seemed to us to exemplify this theme perfectly. It is by no means an isolated example of the type of project which, if deferred indefinitely, would make the nation stronger in her time of peril. At the present time the Central Arizona Project is pigeonholed in committee, but it may be called to the floor of the House for a vote at any time.

Other projects, involving astronomical sums of money, are being promoted. Some of these undertakings are good and wise, but many could be held in abeyance or forgotten entirely. Whenever an agency has to strain for justification excuses, as the Corps of Engineers is sometimes doing on its small-boat and pleasure-yacht harbor development projects, it is time for the construction industry to do some analyzing. Their worthwhile jobs can stand on their own merits; they do not require propaganda selling.

It is not the purpose of this editorial to imply that all or even a majority of Federal agency construction jobs are unnecessary. Certainly the conception of certain dams is sound, even in these times, and some flood-control channels are undoubtedly needed. A first-class highway network capable of standing up under modern traffic is a crying necessity.

But the world situation is such that no amount of construction in itself can save the nation from attack. When the only thing a bully respects is force, the only wise course is to create that force at the expense, if need be, of construction projects no longer justified in the light of the world situation. As Dwight Eisenhower recently said, "It is time to get tough with ourselves", and CONTRACTORS AND ENGINEERS MONTHLY would be something less than honest if it did not point this out.

As a matter of fact, the voluntary cancellation of unnecessary luxury projects is the healthiest course for the construction industry to follow. The nation's contractors have an enormous job ahead to construct installations for the growing armed-forces establishment. Equipment manufacturers and distributors will be hard pressed to build and distribute machinery, and not

a single unit should be used unwisely. The construction industry cannot allow itself to be spread too thin. It must remain strong and healthy to keep the nation solvent, and the movement in this direction must come from within to be effective.

Private hydroelectric power development projects at Kings River, Calif., and Roanoke Rapids, Va., are being blocked at this very moment by Government agencies which argue for Federal development at public expense. It is this sort of thing which should stop at once.

For projects of this nature which are sufficiently sound for private-venture capital to underwrite should have the fullest cooperation from the construction industry. Projects which have to reach out for excuses like "recreation" to partially justify their enormous cost should be deferred at least until the battle for survival this nation is currently fighting is over.

1951 Moles Award

Two prominent contractors have been selected by The Moles—an association of leaders in the heavy-construction industry—to receive the 11th annual Moles Awards for outstanding contributions to construction progress.

Member award winner is Ray N. Spooner, Treasurer and Principal of Allen N. Spooner & Sons, Inc., New York City. Non-member award winner is Lester S. Corey, President of Utah Construction Co., San Francisco. Their selection was announced during The Moles' dinner held in the Roosevelt

Hotel, New York City, in November. Presentation of plaques and award citations will take place January 31 at the Waldorf-Astoria Hotel.

Mr. Corey joined the Utah Construction Co. as a timekeeper in 1901 and became its President in 1940. He has been closely associated with the construction of such famous dams as Grand Coulee, Bonneville, Hoover, and Davis, and with the management of many outstanding railroad jobs.

Mr. Spooner is known in New York as the builder of three of the city's largest piers: Nos. 88, 90, and 92, North River. He is a Past President of the New York General Contractors' Association.

Order M-4 Was Chief Topic At Contractors' Meeting

Walter L. Couse, President, and H. E. Foreman, Managing Director, of The Associated General Contractors of America, speakers at the 30th Annual Convention of the Carolinas branch of the AGC on October 30, 1950, gave the construction industry's viewpoint on the policies established by the National Production Authority in its recent Order M-4.

Mr. Couse told the convention that M-4 was more drastic than orders to which the industry was subject during World War II "... in that it lately prohibits the start of certain kinds of construction, except that a person may appeal if he can show 'unreasonable hardship'." It differs from Order L-41 of World War II which did permit the start of construction found essential to the war effort, or necessary civilian activities, upon approval of an application by the War Production Board. In the present order there is no provision for filing an application for approval.

Both Mr. Couse and Mr. Foreman condemned a policy outlined in section 22.2 of Order M-4 which stated that construction underway at a later date could be halted even though it was not forbidden in the order. They told the convention that they would present their objection to this policy to William H. Harrison, Administrator of the National Production Authority, during the following week. Section 22.2 was later amended.

Neither Mr. Couse nor Mr. Foreman objected to the prohibition which Order M-4 places on the construction of buildings for amusement and recreation purposes.

Eugene Reybold, Executive Vice President of the American Road Builders' Association, a third speaker at the convention, urged greater speed in building up America's highway system. He asked the audience to think of streets and roads as essential elements in the nation's defense-production assembly line.

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Strength of Materials Taught Without Calculus

A new text called "Statics and Strength of Materials", is designed for students or technicians who do not have a background in calculus. Its authors are Jasper O. Draffin and W. Leighton Collins, Professors of Theoretical and Applied Mechanics at the University of Illinois.

In the section on statics, coplanar force systems are treated in detail by the algebraic method, and a chapter is devoted to the explanation of force systems in space. The portion on strength of materials covers simple structural elements involving direct stress, and includes welded connections, torsion, bending, and column action. In a comprehensive chapter on mechanical properties of materials and working stresses, data are presented for modern materials such as lightweight alloys, high-strength steel, and plastics. The text also treats briefly the resistance of materials to energy, creep, repeated loading, and stress concentrations.

The presentation makes much use of free-body diagrams and emphasizes a geometric interpretation and physical visualization of the problem rather than the purely mathematical consideration, yet with but few exceptions all equations are rigidly derived. Prominence is given to general principles and their application rather than to specialized equations.

The authors agree that the method of finding areas of shear, moment, and slope diagrams, or equations for the deflection of beams, is somewhat laborious, but point out that the repeated use of this single procedure has proved to be the method most easily understood by the student with a limited mathematical background. The properties of the areas under curves and moments of inertia are treated by the integral calculus concept of algebraic summation within specified limits. The subject of columns is presented in considerable detail. Working formulas recommended by a number of specification-writing organizations are tabulated.

"Statics and Strength of Materials" is published by The Ronald Press Co., 15 E. 26th St., New York 10, N. Y. The price of the book is \$6.50.

Film on N. Y. Thruway

"Thruway to Tomorrow" is a 20-minute film which tells the story of New York State's 535-mile cross-state Thruway now being built from New York City to Albany, and across the state to Buffalo and the Pennsylvania border.

Warner-Pathe News produced the film for the New York State Thruway Authority, Albany 6, N. Y. You can secure a copy on loan, either 16 or 35-mm., by writing to the Thruway Authority or to the Film Library, one of the New York State Department of Commerce, 40 Howard St., Albany, N. Y. Indicate the name and size of the group to whom it will be shown, and list three choices as to showing date.



Ray N. Spooner (left) and Lester S. Corey are the 1951 member and non-member winners of the Moles Annual awards. Mr. Spooner is Treasurer and Principal of Allen N. Spooner & Sons, Inc. Mr. Corey is President of Utah Construction Co.

Quartzite Tunnel Challenges Miners

Unusual Massive Formation Breaks Without Explosives and Requires Heavy Bracing

By **RAYMOND P. DAY**,
Western Editor

HEAVY ground, excessive water, and a peculiar massive quartzite which occasionally explodes without powder due to ground stresses are combining to make tunnel history 19 miles east of Kamas, Utah. Grafe-Callahan Construction Co., and Rhoades Bros. & Shofner, a joint-venture firm from Los Angeles, are tackling the 6-mile trans-mountain diversion tunnel for the U. S. Bureau of Reclamation.

According to miners, contractor's executives, and Bureau engineers, the tricky quartzite is one of the most difficult tunneling formations they have encountered in years.

The \$4,379,961 joint-venture contract will complete work which Utah Construction Co. started in 1940, but which was halted two years later by the War Production Board. At the time work was stopped, Utah Construction Co. had driven 12,227 feet of the straight tube. The present contract will finish the tunnel excavation, clean up and re-timber a major part of the original work, and line with concrete that portion which may require it.

The Duchesne Tunnel, 8,000 feet high in the Wasatch National Forest, is the first undertaking to tap several streams in the Colorado River drainage, bring them under the mountains, and dump the water into streams tributary to the Great Salt Lake Basin. A more extensive plan known as the Central Utah Project is now only in the development stage, but the completion of the Duchesne Tunnel by 1953 is virtually a certainty.

Duchesne Tunnel will pick up excess water from the west fork of Duchesne River and carry it to the Provo River on the west slope. Approximately 600 cfs can be carried if the tunnel is lined throughout, while the Q-factor will be lower if the bore is not lined. Previous water commitments on the Duchesne River prevent water diversion until those commitments have been met and satisfied. This practically limits the project to the passage of floodwater and spring snow runoff.

The tunnel is a horseshoe-shaped affair, with a finished height of 9 1/4 feet. Its alignment is straight. In its 31,665 feet of length, the grade will drop 63.33 feet from the east to west portal. The tunnel is being driven from the west heading, and no double-portal work is contemplated.

Experts Were Fooled

Expert tunnel men like Project Manager B. A. Peters and General Superintendent Ray C. Blasongame admit that Duchesne Tunnel is in a class by itself.

Peters said, "When we first started re-timbering the old tunnel, all of us thought they had put in far too much. But this is the trickiest ground I ever saw. It's under tension. Leave it unbraced for just a few days, and it may squeeze in."

Expert miners, cocky and fresh from an emergency Bureau of Reclamation tunnel at Palisades, Colo., thought this one would be easy. But when no two rounds shot alike, in spite of their best attempts to drill accurately, it soon got under their skin too.

"You learn to respect this rock when 20 cubic yards pops out from the face,

and you carry part of your crew away on stretchers," Ray Blasongame said.

"Only 12 feet from a Carset bit!" exclaimed a driller.

"And it breaks just as hard as it drills," echoed a powderman.

"It's a good rule of thumb that massive rock formations don't require excessive bracing," Peters explained. "Yet the more massive the formation the more bracing we need. We set 6-inch steel H-beams on 5-foot centers and then had to close the middle. Soon

(Continued on next page)



Bureau of Reclamation Photo

At station 201 + 50 in Duchesne Tunnel, a California switch with two electric locomotives, in the process of changing cars for the mucking machine.

New tractor packs more punch for its size—with help of 54 TIMKEN® bearings!

BIG news for tractor users is this Allis-Chalmers HD-15 tractor, shown below loading a Gar Wood scraper. New from the ground up, it provides more weight and power than previously considered standard for its class.

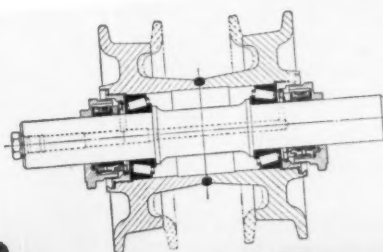
To insure smooth, dependable operation with minimum maintenance, under the toughest loads, Allis-Chalmers mounts vital parts of the HD-15 on Timken® tapered roller bearings. A total of 54 Timken bearings are used.

Timken bearings prevent wear on moving parts by holding gears and shafts in proper alignment. They take both radial and thrust loads in any combination, eliminating the need for special thrust bearings and making possible a more simplified, rugged design. Because of the line contact between Timken bearing rollers and races, Timken bearings provide extra load capacity—carry the heaviest loads safely. And Timken bearings permit the use of tighter closures which retain lubricant, keep dirt out.

The rolls and races of Timken bearings are made of Timken fine alloy steel, case-hardened to give a hard, wear-resistant surface and a tough, shock-resistant inner core. Normally, Timken bearings last the life of the machine in which they are used. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".



This symbol on a product means its bearings are the best.



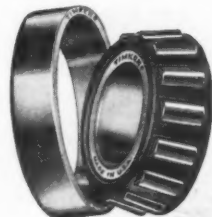
How ALLIS-CHALMERS mounts truck wheel assembly of new HD-15 tractor on Timken bearings. A total of 54 Timken bearings are used in the HD-15, as follows: bevel gear and clutch shaft, final drive pinion shaft, final drive intermediate shaft, pinion drive sprocket shaft, track idlers, track support rollers, truck wheels, power take-off pinion shaft, power take-off gear shaft. And the Gar Wood scraper shown below is also Timken bearing equipped.



NEW ENGINEERING JOURNAL OFFERED!

529 PAGES! Includes new, technical information on bearing applications available nowhere else. Especially helpful to design engineers. Gives bearing dimensions, capacities, selection and mounting data. For a copy, write on your company letterhead to The Timken Roller Bearing Company, Canton 6, Ohio.

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TAPERED ROLLER BEARINGS



NOT JUST A BALL NOT JUST A ROLLER THE TIMKEN TAPERED ROLLER BEARING TAKES RADIAL AND THRUST LOADS OR ANY COMBINATION

Quartzite Tunnel Challenges Miners

(Continued from preceding page)

these braces were taking weight and we were setting more. It doesn't stop after it starts."

There is not a man on the job who does not immediately emphasize that it is the most unusual he has seen. Ray Blasongame went through the San Jacinto Tunnel battle near Banning, Calif., for the Metropolitan Water District. This one, he believes, is just as bad.

A Typical Round

A typical round, if there is such a thing, consists of a cycle that removes about 8 feet. Still, the round had to be shortened to 4 feet to whip the popping rock, and shorter rounds may again have to be instituted in other parts of the tunnel.

A round consists of from 45 to 50 holes, drilled in such a pattern that the key cuts are "pyramided" out. Five Gardner-Denver 79's mounted on a jumbo do this drilling. One Ingersoll-Rand jib mounted on top center adds to maneuverability. Each machine is assigned definite parts of the pattern, so the drill operators know exactly what is required. The air power comes through a 6-inch header from 5 Gardner-Denver electrically powered compressors. There is a Gardner-Denver 500-cfm diesel-driven machine as a standby.

The drilling scheme entails the use of relatively high air pressure and small steel and bits. Crucible steel, with Ingersoll-Rand Carset and Timken carbide insert bits are being used. On an average tunnel of this size, the crew would drill out in about 25 minutes. Here it requires from 1½ to 2 hours. A tungsten-carbide bit, noted for long wear, is battered, worn, and ready for the grinding wheel after 12 feet through hard quartzite. Special grinding wheels, which will sharpen approximately 50 bits at a rate of 15 bits an hour, are used. The man who sharpens bits uses a respirator and face shield to protect himself from the silica disintegration in the wheel.

Atlas Gelodyn 45 per cent stick powder is used at the rate of 5½ pounds per cubic yard. While this amount of powder is large, good fragmentation is necessary so the mucking machine can muck out more rapidly. At first the tunnel was relatively dry, and Atlas Rockmaster delays from zero to 10 performed excellently in the hard dry rock.

As the tunnel progressed farther in under the mountain, more water was encountered. There is 2,500 feet of mountain over the tunnel in one spot, and for thousands of feet the overburden is almost as heavy. When the tunnel reached that point the ground water poured in at the rate of 1,130 gpm, and the powdermen ran into trouble.

Shots laid in a round would explode instantaneously, due to the propagation of the explosion through watery seams. When that happened, the tremendous force would throw rock for 95 or 100 feet, tearing steel bracing and timbers away. Invariably when that happened



C. & E. M. Photo

A train of Wood mine cars is dumped by a Roper Pac hydraulic unit. In the background are shop buildings and the west portal of Duchesne Tunnel.

there was an excess of misfires, also, and heavy hole bootleg was common. Too, the heavy explosions in a long round seemed to invite the quartzite to explode later, by itself. When the rock let go, it usually did so from the

face or the roof up forward. There would be a loud report, like a gun going off, a tremendous concussion, and from 1 to 18 cubic yards would fall in.

Blasongame shifted to Atlas regular delays to whip the propagation, and

shortened the rounds to 4 feet. Six-inch steel supports were placed right against the face. It is believed that this combination helped to cure the rock popping, but just about the time the shorter rounds were started the men began running out of quartzite and into some shale, so they cannot be sure until the tunnel has been driven farther.

The shots are pulled by 220-volt current. Smoke and dust is removed by a 20-inch Naylor Spiralweld pipe, equipped every 2,000 feet with a 15-hp Joy booster fan. Since the intake for this line is usually about 60 feet behind the face, a small 12-inch auxiliary fan line blows smoke and dust from the face to the main line.

Mucking

The average throw with regular blasting delays is about 35 feet, and the rock comes out broken to pieces under 6 inches in size. In an 8-foot round that breaks all the way, leaving

(Continued on next page)

Your material and labor shortages can be solved with

PACIFIC CLAMPS

For your curb and gutter, integral curb, foundations, bridge parapets and special high curb jobs, the PACIFIC all-steel CLAMPS eliminate nailing, save your lumber. Simple, completely adjustable* labor-saving mechanical features—the PACIFIC CLAMPS assure more work out of skilled labor, better work out of unskilled labor.

PACIFIC CLAMPS are completely interchangeable without need of expensive extras for all types of curbs and gutter, integral curbs, foundations, bridge parapets, etc.

The following typical report covers most installations.

... "The PACIFIC CLAMPS did a remarkable job and saved us considerable money. They were installed with one laborer and one carpenter who kept well ahead of the concrete crew."

Write or wire immediately for price and delivery. Indicate type of work, quantity desired.

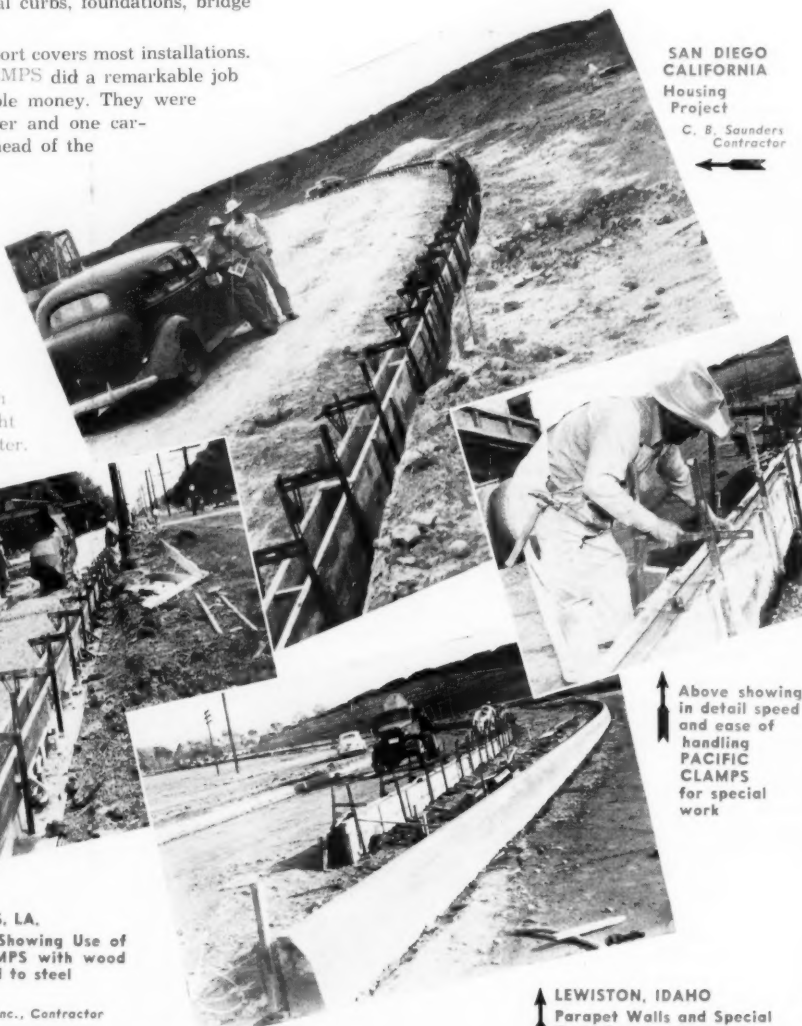
*For any curb width 4" to 10"—any height up to 36"—any batter.



NEW ORLEANS, LA.

Highway Job Showing Use of PACIFIC CLAMPS with wood forms attached to steel road forms

A. N. Goldberg, Inc., Contractor



SAN DIEGO CALIFORNIA Housing Project

C. B. Saunders Contractor

Above showing in detail speed and ease of handling PACIFIC CLAMPS for special work

LEWISTON, IDAHO

Parapet Walls and Special Curb Construction on Clearwater River Bridge Job

Hansen & Parr, Contractors

AMERICAN Deluxe Concrete WHEELBARROW

Code PERFECT 15 Gauge seamless tray

The American Steel Scraper Co. SIDNEY OHIO

PACIFIC ENGINEERING SALES CO.

215-C WEST FIFTH STREET

LOS ANGELES 13, CALIFORNIA

Six-
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no bootleg, there are about 32 cubic yards of pay material. A swell factor of 100 per cent plus overbreak leaves about 68 cubic yards to be mucked out.

Two Eimco 40's, cut down so they will work in this tunnel, are doing the excavation. One machine works regularly; the other is a standby. A small Eimco 21 also saw some service, particularly on the early cleanup of the tunnel that was drilled back in 1940-42, but now it is merely a standby piece of equipment.

Hauling units consist of 20 side-dump Wood mine cars of 4-yard capacity. A California switch is used, with one locomotive passing an empty to the mucking machine, and the other picking up a train of loaded cars. Locomotives consist of 3 Greensburgs and 1 Goodman battery machine, with a Plymouth diesel-powered standby machine for use out in the headquarters yard.

Turner couplings are used to join the cars. This is a fast, safe coupling that Blasongame feels sure has speeded up mucking and reduced hand injuries.

When the Eimco machine finishes mucking, and the trains have gone to dump their material outside the west portal (a Roper Pac hydraulic lift dumps each car), at least one round of steel bracing is set. Bracing consists of two 6-inch WF 20-pound steel ribs, which rest on base pedestals and bolt together at the top by a flanged connection.

These pieces, bent to conform to the tunnel shape, come in by truck and are handled by three men. When they are set up, 8 pieces of 4 x 6 Douglas fir timber are driven between the webs to act as spreaders, and 6 steel tie rods, 5/8 inch round, are installed to prevent spreading. Heavy 3 x 12 Douglas fir planking is also installed behind the H-beams to stop the spalls. The formation is peculiar, because so long as it is supported, it will remain perfectly sound and solid. But if it is not supported, or the supports are removed for just a few weeks, the ground stresses will cause the tunnel roof to spall.

For this reason the supports are kept as close as possible to the tunnel face, and are never more than 10 to 20 feet away. The steel H-beams are being used on 1.25, 1.5, 2.0, 2.5, 3.0, 4.0, and 5-foot centers depending on the ground formation. They are needed most where the quartzite is most massive and solid, due to the popping condition, and in all sections of the shale formation encountered thus far.

Working 24 hours a day, 6 days a week, the contractors are moving ahead steadily. Progress is not as rapid as was believed possible, and about one and a half 8-foot rounds per 8-hour shift is considered a good day's work.

Weather and Water

Duchesne Tunnel is in an unfavorable location so far as weather and water are concerned. Accessible only by Utah State Highway 150, a graveled road, the tunnel is high up in mountains which get heavy rainfall, and heavy snow from October 15 to May 15. Shops, yard, and accessways must be covered for snow protection.

Water, too, is a bad problem. From every angle it pours into the tunnel.



**"SURE
SHOT"**

CONCRETE HANDLING BUCKET

Inexpensive
Saves labor
Eliminates runways
Works close to
form or wall

Uses your crane to
full advantage
No corners to clog
Leakproof gate
Protected nose

TWO SIZES WRITE FOR CIRCULAR
HENKE MANUFACTURING CORP., JAMESVILLE, IOWA



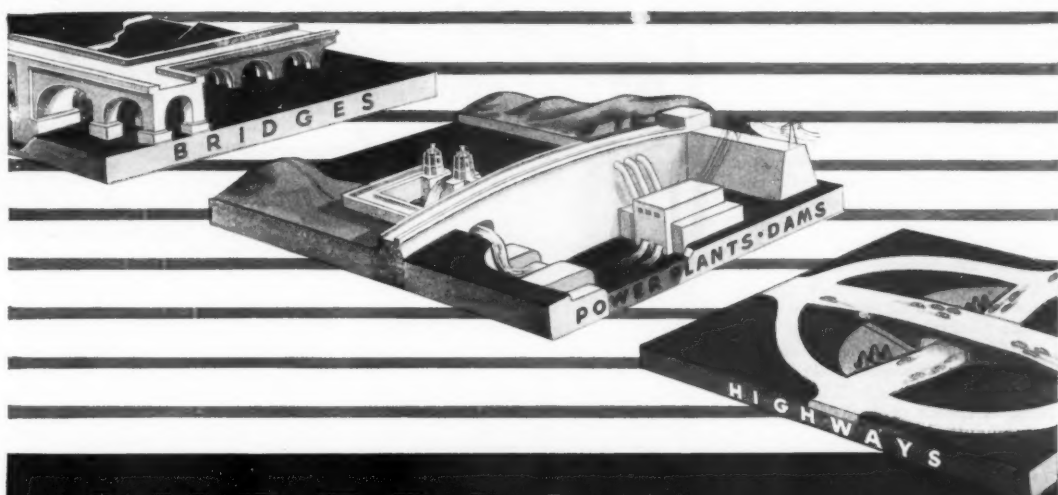
C. & E. M. Photo
In Resident Engineer Pope's office we see him at the left, then General Superintendent Ray C. Blasongame, and Howard W. Woods, Project Engineer for the contractors.

Often the drillers have to sink side holes into the formation to relieve the water, which will then pour in a stream. The water is being picked up by a sump pump and sent to the portal through a 20-inch Naylor pipeline. Howard W. Woods, the job Engineer, made a concrete weir and measured the peak flow thus far at 1,130 gpm.

At the heading, however, there seems no way to cope with the water. Each blast loosens a few wedges, which float around. Unless each one is picked up and stacked up high and dry, they will float under a wheel of the mine cars and derail them. That means a delay, and another headache for the shift boss. The two lifter drills are practically down in the water, and before a drilling round begins, the water is brought down by means of two "whirley" sump pumps.

The water has only one advantage. Drill water to cool the bits and flush drill dust away can be picked up close to the heading. It doesn't have to be

(Concluded on next page)



SUPERIOR*

*Noah Webster defines SUPERIOR as "higher in degree or grade, above average in excellence." In the field and office, the products of SUPERIOR Concrete Accessories, Inc. have always stood for "above the average in excellence."

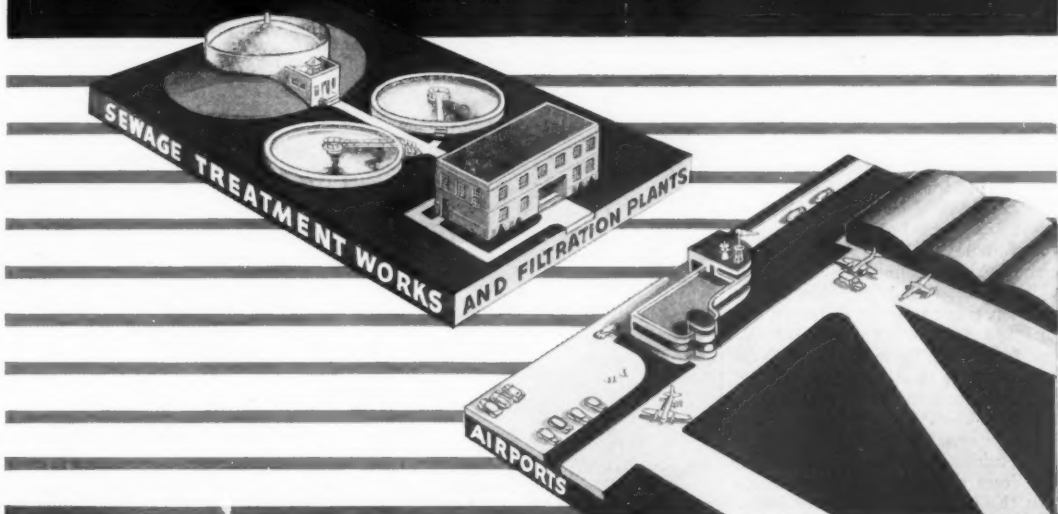
For heavy duty, SUPERIOR Standard and Cone Fast Coil Ties and Tilt Lock Clamps for threaded rods have a reputation for reliability and lowered forming costs. You, too, can cut costs by using SUPERIOR Form Ties. Our engineers are available to help with your forming problems.

SUPERIOR CONCRETE ACCESSORIES, INC.

4110 Wrightwood Avenue, Chicago 39, Illinois

Pacific Coast Plant: 2026 Livingston St., Oakland 6, Calif.

New York Office: 1775 Broadway, New York 19, N. Y.



Quartzite Tunnel Challenges Best Miners

(Continued from preceding page)

pipel long distances.

Personnel

The Duchesne Tunnel, a part of the Bureau of Reclamation's Provo River Project, is under the general supervision of L. N. McClellan, Chief Engineer, E. O. Larson, Regional Director, and L. R. Dunkley, Project Engineer. N. L. Pope is Resident Engineer.

For the contractors, B. A. Peters is Project Manager, with Ray C. Blason-game as General Superintendent. Elmer C. Barr and John Coyle are Assistant Superintendents. Howard W. Woods is Project Engineer, Elmer Clausen is Office Manager, and the three Shift Foremen are Frank Brooks, William Roberts, and Bill Gines.

One of the toughest key spots of all is held by Merl Miller, Master Mechanic and Chief Electrician. The maintenance of electrical equipment in a spot where men all wear raincoats and rubber boots is not an easy job in anybody's language.

New Vitrified Bond For Grinding Wheels

A 5 to 10 per cent boost in grinding and finishing output is claimed for the new vitrified bond developed by Chicago Wheel & Mfg. Co., 1101 W. Monroe St., Chicago 7, Ill. Bond 79E is recommended by the manufacturer for portable grinding of billets, brake drums, forgings and forging dies, annealed malleable castings, steel castings, centers and stainless-steel welds, etc. It is said to provide a smooth, fast cutting action for vitrified grinding wheels operated at speeds up to 6,000 surface feet per minute.

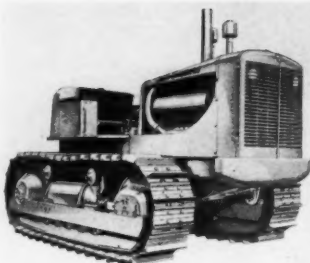
Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 326.

New Diesel Tractor

A new torque-converter-equipped tractor, the HD-20, has been introduced by Allis-Chalmers Mfg. Co., Tractor Division, Milwaukee 1, Wis. The new unit features 41,800-pound weight, long wide tracks, and a new 2-cycle GM 6-110 diesel engine. The three-stage hydraulic torque converter eliminates most gear shifting and keeps the tractor working smoothly at higher average speeds, according to the manufacturer.

Operating adjustments, maintenance points, and major assemblies are located and designed so that the care, maintenance, and repair of the tractor can be accomplished with minimum effort. Unit construction allows removal or replacement of major assemblies without disturbing adjacent parts. Positive-seal grease-packed truck wheels, idlers, and support rollers are serviced at the factory and thereafter require greasing attention every 1,000 hours. A wide adjustable operator's seat affords maximum visibility to front and rear. Hydraulically powered steering levers offer finger-tip steering. Adjustable brake pedals, self-energizing brakes, convenient arrangements of other controls, and a large clear operator platform are additional features that eliminate much unnecessary operator fatigue and provide operator efficiency, Allis-Chalmers says.

A larger idler and sprocket and a 106%-inch track provide stability, flotation, and traction. The welded A-frame track stabilizer on the HD-20 reduces twisting strains and offers rigid track alignment. A double-reduction final drive gives high ground clearance. The sturdy, floating, equalizer spring cushions the main frame and engine from ground shocks, and helps absorb the stresses imposed by front-



Allis-Chalmers announces a new diesel tractor, the HD-20, equipped with a three-stage torque converter that eliminates most gear shifting.

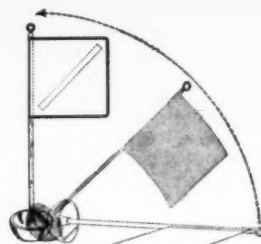
mounted equipment, the company says. Further information may be secured

from the company. Or use the Request Card at page 16. Circle No. 276.

Danger-Flag Standard

A new danger-flag standard has been engineered by Industrial Products Co., 2855 N. Fourth St., Philadelphia 33, Pa. The unit is known as the Ipco Wind-proof flag standard and consists of a 7-inch-diameter cast-iron base and a 13 x 13-inch red canvas flag mounted on a 32-inch staff, with a nonrusting eye and ferrule at the top of the staff.

The flag is held spread by means of a spring-steel stay inserted diagonally in a canvas pocket. The eye at the top of the unit is used when making up barriers on streets, around manholes, for industrial repairs, etc. The unit is



The Ipco Wind-proof flag standard has a cast-iron base 7 inches in diameter.

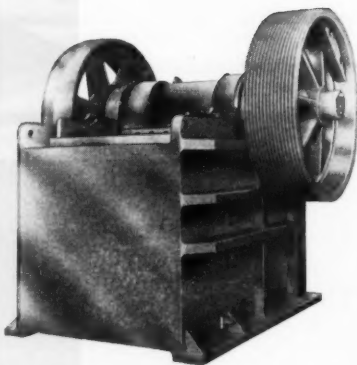
easy to set up or take down, and the flag and staff separate from the base.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 277.

for GREATER PRODUCTION CAPACITY INCREASED PLANT EFFICIENCY LOWER OPERATING COSTS

INSTALL

for crushing

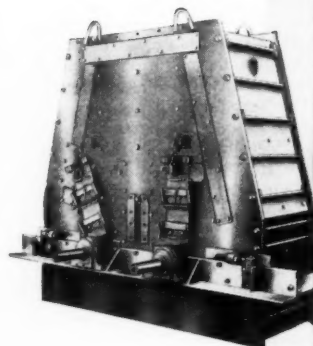


JAW CRUSHERS

HERE'S the high capacity primary crusher that sets the production pace for your entire plant! Cedarapids quality-built Jaw Crushers are the overhead eccentric type with one stationary jaw and one movable jaw and are engineered for extra capacity with smooth, steady performance plus low operating and maintenance costs. There's a size for every need from 6" x 12" to 32" x 40".

DOUBLE IMPELLER IMPACT BREAKERS

THIS is the unit that assures greater hourly tonnage capacities of the cubical shaped aggregate required in so many specifications today. Used for both primary and secondary reduction in many applications, its extremely high ratio of reduction eliminates much accessory equipment such as secondary crushers, screens, conveyors, etc. Less horsepower required because a high percent of material is broken in suspension. 50% less contact of stone on metal reduces wear on working parts. Four sizes available.



Use Cedarapids Crushers in your plant to be sure of meeting production schedules

TWIN JAW CRUSHERS

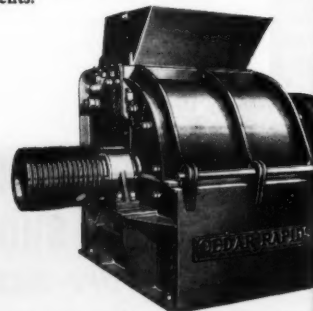
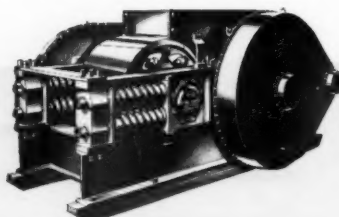
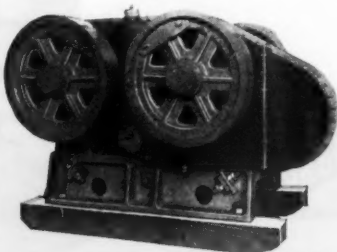
YOU get approximately twice as much capacity with a Cedarapids Twin Jaw Crusher as with a single-jaw crusher of the same size. This increased capacity is ideal for maintaining high production in pits with 50% or 60% of oversize material to be crushed. Rubbing between jaw plates is eliminated because both jaws move in-and-out as well as out-and-away in synchronized motion. A complete range of sizes.

ROLL CRUSHERS

For secondary crushing, Cedarapids Roll Crushers assure high production of the required smaller size aggregates. Manganese steel roll shells, either smooth or corrugated, and large, heavy flywheels, plus other heavy-duty construction features provide maximum long life and economical operation. Cedarapids exclusive patented safety shear plates prevent crusher damage from foreign material. Sizes range from 16" x 16" to 40" x 24".

HAMMERMILLS

Cedarapids Hammermills feature a revolutionary principle of crushing to give more tons per hour of finer quality finished products than similar types of equipment of comparable size. They produce either crushed limestone up to 1½", or agricultural lime, or a percentage of both, depending on the setting of the grates and speed of the rotor. Three sizes . . . 2033, 3033, and 4033, will meet all your requirements.



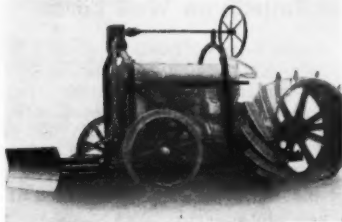
THE IOWA LINE of Material Handling Equipment Includes:

ROCK AND GRAVEL CRUSHERS • BELT CONVEYORS • STEEL BINS • BUCKET ELEVATORS • VIBRATOR AND REVOLVING SCREENS • UNITIZED ROCK AND GRAVEL PLANTS • FEEDERS • TRAPS • PORTABLE POWER CONVEYORS • PORTABLE STONE AND GRAVEL PLANTS • REDUCTION CRUSHERS • BATCH TYPE AND VOLUMETRIC TYPE ASPHALT PLANTS • HAMMERMILLS • DRAG SCRAPER TANKS • WASH PLANTS • SOIL COMPACTION UNITS • STEEL TRUCKS AND TRAILERS • KUBIT IMPACT BREAKERS • DOUBLE IMPELLER IMPACT BREAKERS

Evolution of a Bulldozer

A 4-page bulletin describing the evolution of the Baker bulldozer—from the first backfiller in 1918 to the new 1950 engine-mounted hydraulic bulldozer—has been prepared by The Baker Mfg. Co., Springfield, Ill. The literature points out that prior to 1918 earth-moving was accomplished pretty much by scrapers operating from the rear of tractors or horse teams.

In 1918 Baker developed a front-mounted backfiller for the Fordson or McCormick-Deering tractors. In 1924 the first Baker bulldozer was developed and this was advanced to a hand-hydraulic model in 1926. A power hydraulic model was introduced by Baker in 1928 and then followed with an in-



From 1918 to 1950 with Baker—at left, the first Baker front-mounted backfiller for Fordson or McCormick-Deering tractors; right, a modern Baker hydraulic dozer for Allis-Chalmers tractors.



direct-lift model in 1930 and a twin-hydraulic-cylinder model a little later. The literature follows this evolution all the way through, with descriptive text and illustrations of each model.

This literature may be obtained from

the company, or by using the Request Card at page 16. Circle No. 336.

Regular purchase of U. S. Savings Bonds means personal security as well as a share in the national security.

Hard-Surfacing Rod Now Metallic-Coated

A new metallic-coated electrode for arc welding, designated as Ranite No. 4 Electric, has been introduced by Rankin Mfg. Co., 3072 W. Pico Blvd., Los Angeles 6, Calif. According to the company, the core wire is of high-alloy cast material, with a special coating to increase further the alloy content of the weld. Operation is said to be smooth. One of the features of the 18-inch electrode is that it can be gripped anywhere along the rod length, not necessarily at the center or at the end.

At 800 degrees F, the Rockwell C hardness is 45. The ultimate hardness ranges from 56 to 60 on the Rockwell C scale. The weld can be hot-forged, the company says. The Ranite No. 4 rods can be used for ac or dc operation, straight or reversed polarity. Rod sizes of 1/8, 5/32, 3/16, 1/4, and 5/16 inch are available.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 308.

Structural-Steel Booklet, Fabricating and Erecting

A new fully illustrated brochure describing the plants and products of American Bridge Co., Frick Bldg., Pittsburgh 19, Pa., has been prepared by the company. An excellent set of photographs illustrate many of the structures for which American Bridge, a United States Steel Corp. subsidiary, did the fabrication or erection. The literature also outlines the fabrication procedure that is followed in the company's plants and describes the types of buildings, shops, yards, and facilities in each of these plants.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 394.

Tank-Trailer Catalog

A new catalog on the complete line of Fruehauf tank trailers is available from Fruehauf Trailer Co., Detroit 32, Mich. It details the construction features of these asphalt, bulk-cement, and water carriers, and illustrates them with cutaway drawings which show how the tank sections are fabricated and finished.

The bulk-cement tank is designed for capacities of 90 to 300 barrels and provides for cement delivery by means of motor-driven screws mounted on V-troughs. The asphalt carriers have capacities up to 4,000 gallons and feature 2-inch rock-wool insulation, two 6-inch-diameter heater tubes with oil burners, and a 30-gallon fuel tank. The single-compartment water carrier has a capacity of 3,000 gallons.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 261.

Osgood, General Excavator Combine Sales Management

Last October The Osgood Co. and The General Excavator Co. of Marion, Ohio, combined their sales management and policies for the distribution of Osgood and General power shovels, cranes, draglines, clamshells, hoes, and Mobilcranes. Only the sales efforts were affected; other functions are still carried on by the individual companies.

L. O. McLean, formerly Sales Manager for General, is now Director of Sales Development. James S. Fortiner, who used to be Assistant to the Vice President of Osgood and General, is now Sales Manager for the combined office. Kenneth O. Williamson is Assistant Sales Manager; he used to be Sales Manager in New England.

Osgood also announces that its former Sales Manager, George Day, has retired after 45 years in the power-shovel industry, 30 of them with Osgood.

CEC DARAPIDS AGGREGATE PRODUCING UNITS Now!

for material handling

CONVEYORS

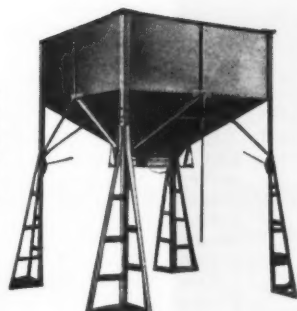
Cedarapids portable belt conveyors with their own power unit are the flexible and economical answer to aggregate handling problems. Either the channel frame or lattice frame type can be supplied in 30', 40' or 50' lengths and 18" or 24" widths.

FEEDERS

Apron type or reciprocating feeders provide a smooth, workable flow of material to crushers, conveyors and bucket elevators, preventing overloads and surges. Available in a wide variety of sizes for all types of aggregate or asphalt plants.

BINS

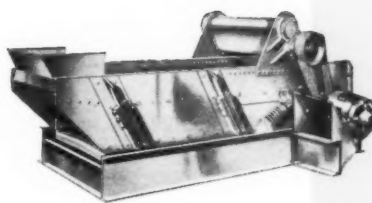
All-steel storage and loading bins give sturdy, dependable storage facilities for all types of prepared material. Jack leg and knockdown types are available with or without partitions. Special sizes and types can be built to order.



for screening

HORIZONTAL VIBRATING SCREENS

Here is the most efficient screen available today! Its better screening action, highly accurate gradation and large capacity combine to give you faster and more profitable screening at lower cost. Sizes range from 36" x 8' to 48" x 14' in single, double or triple deck styles. In addition, the Cedarapids line contains screens for special uses in a wide variety of sizes, including ag-lime screens, inclined vibrator screens and revolving screens.



for complete plants

From the Single Pass Plant or Pitmaster for the smaller jobs...to the Junior or Master Tandem...or the complete 4-unit Unitized Plant for the largest operations, there's a Cedarapids complete portable aggregate plant in a size and type to fit your pocket-book as well as your production needs.

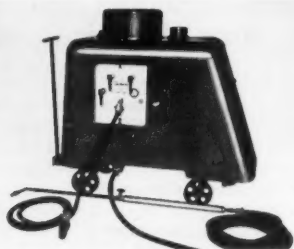
Your Cedarapids distributor will gladly give you production facts and figures on all Cedarapids equipment, including the complete line of portable bituminous mixing plants. Call on him today.

IOWA MANUFACTURING COMPANY

Cedar Rapids, Iowa, U. S. A.

Cedarapids

Built by IOWA



The Model JO Hypressure Jenny is a combination steam cleaner and flusher for automotive cooling systems.

A Combination Unit For Engine Cleaning

A new combination steam cleaner and flusher for automotive cooling systems, known as the Model JO Hypressure Jenny with built-in Steam Thoro-Purge, has been announced by Hypressure Jenny Division, Homestead Valve Mfg. Co., P. O. Box 843, Coraopolis, Pa.

It features an oil-fired electric-motor-driven steam cleaner which operates at 80 to 120-pound pressure, with 90-gph water capacity; and a cleaner that reverse-flushes complete cooling systems, including radiator, engine block, and water-type heaters, in one operation. It is said to be the only cooling-system cleaner of its type that employs heat, chemical, sudden but safe temperature changes, and strong air blast to remove thoroughly all grease, sludge, and scale from the system.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 330.

New Simple Device Checks "Lost" Time

There are many applications in the construction industry for the Pe-Ka Travel Log, according to Knopf Instrument Co., 250 Culver Ave., Jersey City 5, N. J. It may be used on trucks, tractors, concrete mixers, crushers, or wherever a contractor desires to check up on "lost" time.

On vehicles the instrument records automatically the mileage between stops, total mileage, average speed of the vehicle, number of stops made, and duration of stops. The operator can also write in the reasons for stops and other pertinent information.

The company points out that the Travel Log can augment or replace the daily log. With the write-in feature, the driver can make all notations he makes on a daily log, but the instrument notes the time. He writes through a small window in the cover which makes it impossible for him to make his notations at any time other than that at which the stop occurred.

When used on stationary machines, the instrument will record quantities produced, speed at which the machine operated, number of shutdowns or stops, and the duration of each shutdown. Again, the operator can write in the reason for stops.

The Pe-Ka Travel Log may be mounted in a number of positions and connected to the driveshaft or other moving part of the machine or vehicle. Travel Logs with 12 or 24-hour calibrations may be obtained.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 396.

Hydraulic Lift Equipment

A broadside describing five pieces of hydraulic lifting equipment has been offered by the National Lift Co., 225 Madison St., Waukesha, Wis. This broadside includes the Jumbo twin hoist, designed for 1½ and 2-ton trucks; the Dump-O-Matic twin hydraulic hoist for pickup trucks; the Lift-O-Matic, a hydraulic tail gate for pickup trucks; the

Hydra-Clutch pump; and the Snowlift, a hydraulic control for snowplows mounted on trucks or tractors. Each unit is fully illustrated and described. Specifications, prices, and details of the construction features are included.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 366.

Clamshell-Bucket Folder

A new 8-page booklet on clamshell buckets for excavating and rehandling may be secured from George Haiss Mfg. Co., Inc., 141st St. on Park Ave., New York 51, N. Y. Capacities, dimensions, and all construction features are given for the full line. Excavating and trenching buckets are available in sizes from ¼ to 2 cubic yards. The rehandling and light digging buckets are available in sizes from ¾ to 3 cubic yards. Each model type is illustrated.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 254.

Bulletin on Wall Forms

A new 4-page bulletin describing and illustrating forming systems for concrete-wall construction has been prepared by Symons Clamp & Mfg. Co., 4251 Diversey Ave., Chicago 39, Ill. Erecting and stripping features, assembly details, and standard sizes, are explained in a short factual manner. Detailed information is given on the wood,

plywood, plywood with magnesium frames, and all-magnesium forms.

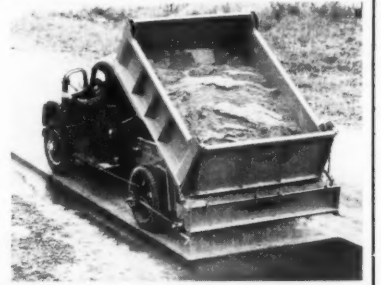
In addition, Symons Form System Service is explained, including its rental with purchase option, the availability of hardware and fittings as well as other supplies, and the complete engineering service for customers.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 295.

Do your sealcoating and ice control jobs the fast easy Swenson way. Spreads any width or amount desired.

Free information

Swenson Spreader & Mfg. Co.
Lindenwood, Illinois



Which Produces More?

... one 4' x 10' screen
... two 4' x 10' screens

Naturally, two screens produce twice as much as one if the same size material is fed to both

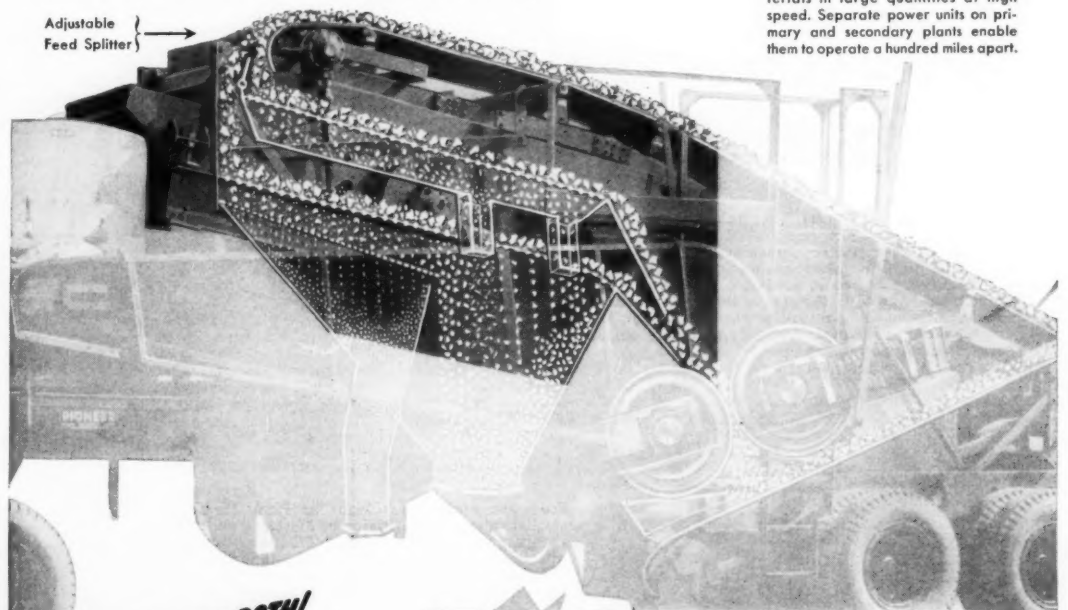
Pioneer uses the two screen principle in its 2-Unit Rock and Gravel Plants. Split Deck Feed (see illustration below) doubles the screening capacity of the secondary plants.

Here's how it works. An adjustable baffle plate located at the feed end of the screen splits the flow of material from the conveyor. Part goes to the top screen and part to the bottom. Top and bottom decks have the same screen mesh. Each produces specification independent of the other because they are separated by a blank center deck. Material from the top screen is chuted around the bottom deck to the pay hopper.

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New-Type Finisher On Concrete Paving

Jim Baltes, Ohio Contractor, Designs and Builds Machine
For Use on 6.4-Mile Dual Highway U. S. 20 Project

♦ SOMETHING new in the way of concrete-finishing machines appeared in Ohio this past construction season when A. J. "Jim" Baltes, Norwalk, Ohio, contractor, introduced his own "patent-applied-for" concrete surface finisher. Labeled No. 101, the unique rig operated behind a concrete spreader and a dual-screed finishing machine in paving 12-foot lanes of a dual highway on U. S. 20 in the northern part of the Buckeye State. According to the contractor, his new machine eliminates the irregularities caused by hand floating and check marks from straightedging, besides consolidating the top of the slab and making the concrete denser by squeezing out excess water that flows off the surface and out over the form on the low side of the lane.

The principal feature of the unit is a 1/4-inch steel plate 10 feet long x 12 feet wide, the width of the lane being laid. It is supported on a four-wheel steel carriage powered by a Hercules gas engine by which it is either self-propelled over the forms, or pulls itself along by cables running from drum hoists on the machine out to anchored form pins up ahead. The plate may be either flat or crowned to conform to the design surface of the road; the necessary adjustments are made with a series of screed bolts. While the plate rides along the surface of the concrete, two cams on each side prevent the plate from being dropped suddenly or too hard on the freshly placed material. The cams come in contact first with the top of the form rails, and check the drop.

On the front of the finisher are two booms by which the plate is hydraulically raised. Generally only one pass of

the machine is required, but if it does have to backtrack, the plate is lifted clear of the concrete surface while the reverse run is made. Behind this machine a burlap drag is pulled over the surface of the concrete, and this is followed by an application of a spray curing compound.

Two-Season Job

The project is 6.4 miles long in Huron County, and extends a dual highway from Bellevue east to Monroeville. The existing U. S. 20 for this stretch had a



C. & E. M. Photo

A. J. "Jim" Baltes at right of his concrete-finishing machine, the No. 101.

24-foot pavement that had been built up over the years from a brick road. The bricks gave way to concrete, which in turn was surfaced with blacktop several times over the years along with

widenings to its present 24 feet. This improvement consists of adding a second 24-foot pavement, separated from the original by a central mall 50 feet

(Continued on next page)

THERE ARE *Only 3* TYPES OF HEAVY RUBBER-TIRED SCRAPER EQUIPMENT

1.

The SEMI-TRAILER



2.

The TWO AXLE UNIT



3.

The TOWING TYPE TRACTOR and Weight Transfer



This is a message to all who desire high production at low cost in dirtmoving. This is a message to all who desire dependable equipment, yet with minimum equipment investment and minimum equipment inventory. There are only three types of heavy, rubber-tired scraper equipment.

When the two earlier type units were designed (the semi-trailer and the two-axle units) the necessity of weight on the tractor drive axle for traction was recognized as being mandatory. To obtain this weight, the scraper in both instances was designed with only a rear axle while the tractor carried a portion of the load on the drive wheels. In both instances, the capacity of the scraper was limited to the amount of tractive ability available, and the ability of the prime mover to carry the load at high speed.

By the introduction of the exclusive M-R-S feature of "Weight Transfer", the same principle of operation of the crawler-type tractor as used so successfully with larger capacity scrapers for many years, has now been modernly applied to rubber. Through this modern "weight transfer" principle, the prime mover is no longer constantly carrying the burden of the trailer and payload, but simply borrows weight in the desired amount when added traction is needed.

Only M-R-S Tractors are equipped with Weight Transfer. Only with M-R-S Tractors can you "switch" your presently owned large size, standard make, four-wheel scrapers between crawler and rubber tired power and speed. Only with M-R-S Tractors can you have speed, and power and versatility at low equipment investment.

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Prime Mover
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Write today for further information on this modern method of traffic control

INTERSTATE RUBBER
PRODUCTS CORPORATION
1638 W. Jefferson Boulevard
Los Angeles 18, California

New-Type Finisher On Concrete Paving

(Continued from preceding page)

wide on the average.

On the westerly half of the project the new pavement is on the north side carrying west-bound traffic, while on the easterly half the new pavement is on the south side of the dual highway and carries east-bound traffic. Only at the mid-point or transition section were two parallel strips of new pavement required. Then the old pavement was filled over, and new concrete laid on top. The major structures on the job, dual bridges over a creek, are located at this mid-point.

Work on the improvement got under way in the spring of 1949 after the Ohio Department of Highways awarded a contract to A. J. Baltes, Inc., of Norwalk, Ohio, on its low bid of \$908,464.76. By the fall all the fills were made. The material was mostly clay, and as the cuts were fairly shallow, borrow pits were resorted to for the needed dirt.

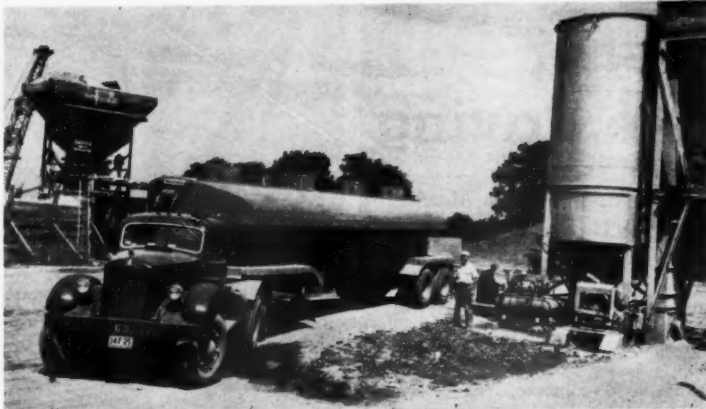
A Thew-Lorain 77 1/2-yard shovel worked the pits, loading out to a fleet of eight bottom-dump Euclids averaging 13 yards. On the roadway the contractor operated four Caterpillar DW10's with scrapers, and two experimental Euclid units—a single-engine and a twin-engine scraper. Fills were built up in 8-inch lifts and compacted by sheepfoot rollers.

Special Base Course

Under all the new paving is a sub-base of sand and gravel, 6 inches thick and 26 feet wide, so as to extend one foot beyond the concrete on each side. Suitable pit-run gravel for this purpose was obtained from a site west of Bellevue entailing an 8-mile haul. Material was dug from the pit by a Lima 3/4-yard dragline, and transported in a fleet of up to 30 trucks carrying 4 to 5 yards a load. It was spread by dozers and graders, and compacted by a 10-ton roller. Some of the base course was done in the fall of 1949, but the bulk of the work was done in 1950. The finished roadway has 10-foot shoulders on the outside, sloping 1 inch to the foot. On the inside is the central mall, depressed to the center with a similar slope of 1 inch to the foot for 10 feet and variable slopes to the center of the mall for drainage. Cut and fill slopes are 3 to 1 and 4 to 1 respectively.

Other pre-paving preparations involved the stockpiling of large quantities of sand for the concrete over the winter months. A manufactured stone sand was supplied by Basic Refractories of Maple Grove, Ohio, and delivered to the project by truck after a 35-mile haul. Two sizes of crushed stone aggregate, No. 3 and No. 4, were furnished by the France Stone Co. from its plant at Bellevue. It, too, was delivered by truck to the batch plant, set up by the side of the highway midway of the job.

A Heltzel 105-ton 3-compartment bin was kept filled from the aggregate stockpiles by a Lima crane equipped with a 50-foot boom and an Owen 1 1/2-yard clamshell bucket. Air-entrained cement containing Vinsol resin was furnished by the Medusa Portland Cement Co. from its plant at Baybridge, Ohio, 20 miles away. Delivery was handled by Russell Trucking Line, Inc. of Castalia, Ohio, which employed two 130-barrel Trailmobiles with Mack diesel tractors for hauling the bulk cement. A Heltzel 400-barrel plant stored the cement—133 barrels in an overhead bin and 267 barrels in the adjoining silo. A Worthington compressor at the plant aided in unloading the trucks into a hopper from which the cement was moved by worm gear to an elevator. It was raised to the top of the bin, overflow cement dropping into the silo. At the bottom of the silo a hopper connected to the foot of the enclosed elevator, thus insuring a steady flow of



C. & E. M. Photo

A Trailmobile pulled by a Mack diesel tractor brings 130 barrels of bulk cement to Baltes' Heltzel bin, on the 6.4-mile project in Huron County, Ohio.

cement to the bin.

The Mix

A dozen trucks, 7 contractor-owned

and 5 hired by the hour, hauled two batches each an average distance of 1 1/2 miles from plant to paver. They first backed under the aggregate bin for sand

and stone, then drove through the other bin to pick up the cement which was carried in separate metal tanks.

Weights of a typical 9-bag batch were as follows:

Cement	846 lbs.
Sand	1,606 lbs.
No. 3 stone	1,550 lbs.
No. 4 stone	1,020 lbs.
Water—5 1/2 gals./bag	412 lbs.

Total 5,434 lbs.

The average slump with this mix was 2 3/4 inches. The gradation of the two sizes of stone used in the mix conformed to the following:

Sieve Size	Per Cent Passing	
	No. 3 Stone	No. 4 Stone
2-inch	100
1 1/2-inch	80-100
1-inch	20-60	100
3/4-inch	0-20	80-100
1/2-inch	20-60
3/8-inch	0-5	5-30
No. 4	0-5

Water for the concrete was pumped from an inundated roadside borrow pit by a Rex 4-inch centrifugal pump into a 2,000-gallon storage tank set up on (Concluded on next page)

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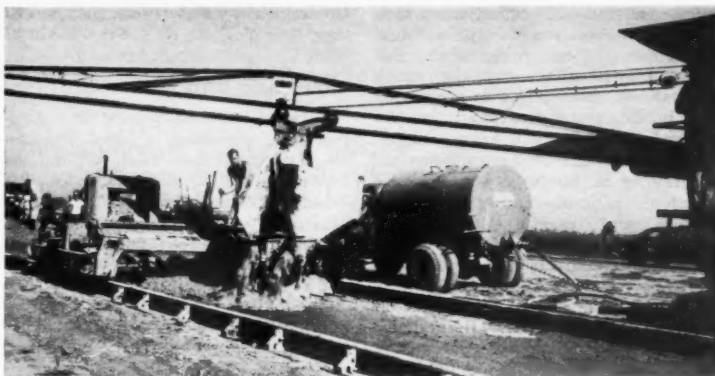
other
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timber cribbing. From there it flowed by gravity into two 1,500-gallon tanks mounted on International trucks that supplied the paver. The transfer was made by a 2½-inch pump on the paver.

Laid in 12-Foot Lanes

The 24-foot 9-inch uniform-depth reinforced-concrete pavement was laid in two 12-foot lanes. Paving started early in July and was completed by September. The contractor had a total of 6,000 linear feet of road forms on the job, both Heltzel and Blaw-Knox. Pins were driven with an Ingersoll-Rand pneumatic hammer powered by a LeROI Tractair mounting a 105-cfm air compressor. Fine-grading was done with a Caterpillar No. 12 motor grader which pulled along a Heltzel planer to make the final cut. The grade was then checked with a scratch template, and rolled by a Buffalo-Springfield 3 to 5-ton tandem roller.

Contraction joints are spaced 40 feet, and expansion joints 500 feet apart. They were laid out on the subgrade



C. & E. M. Photo
On U. S. 20 in Ohio, a Koehring 34-E Twinbatch paver discharges a batch of concrete in front of a Jaeger spreader. The water truck is in the rear.

since the paver worked outside the forms. Bethlehem Steel Co. assemblies were used for both types of joint, with the Pollock Steel Co. of Marion, Ohio, supplying the dowel bars. In both types of transverse joints, 1 x 18-inch dowels

were spaced on 12-inch centers. The Philip Carey expansion material is 1 inch thick x 8 inches deep, and came in a single 12-foot strip. It was left 1 inch low for later filling in with sealing compound.

The adjoining 12-foot lanes are tied together with a keyway, a metal strip bolted to the forms, and with hook bolts along the longitudinal joint on 3-foot centers. The bolts are ¾ inch x approximately 14 inches long, having hooks on each end. They came in two pieces, one screwing into the other after the first lane was poured. Forms were oiled and the subgrade wet down as final steps before the paving.

Paving

Batches were mixed 1¼ minutes in a Koehring 34-E Twinbatch paver having a 50-foot boom. Concrete was deposited on the subgrade in front of a Jaeger screw-type spreader which carried two Jackson vibrators at the rear for vibrating along the forms. This machine struck off the concrete 2 inches below the top of the form for the placing of the steel mesh. The reinforcing was supplied by the American Steel & Wire Co. of Cleveland, Ohio.

More concrete was then placed to fill up the forms. Behind the spreader came a Jaeger-Lakewood dual-screed finisher, followed by the contractor's own plate-type surface finisher. After that the slabs were given a burlap drag treatment, and sprayed with a membrane curing compound furnished by the Marietta Paint & Varnish Co. of Marietta, Ohio. It was applied with a DeVilbiss spray unit mounted on a Flex-Plane four-wheel carriage riding over the forms. Joints were edged with a ¼-inch radius tool. The longitudinal joint between the two lanes is ¾ inch wide on top and 1½ inches deep.

Forms were removed the morning following the day's work, lifted out with a boom truck, and moved ahead. Joints were filled with Careylastic sealing compound heated in a White kettle. An average of 2,000 linear feet of 12-foot lane was laid in an 8-hour work day.

Quantities and Personnel

The major items in the grading and paving contract included the following:

Roadway excavation	80,709 cu. yds.
Borrow	43,032 cu. yds.
Classified embankment, subgrade	18,242 cu. yds.
Reinforced-concrete pavement, 9-inch	94,519 cu. yds.

A. J. Baltes, Inc., employed an average force of 150 men on the project. A. J. "Jim" Baltes gave the work his personal supervision, assisted by his son John W. Baltes as Superintendent and Dave Tucker, Concrete Foreman.

For the Ohio State Department of Highways, Earl Hochenadel was Project Engineer. The project is located in Division 3 which is headed by J. A. Tomasic with headquarters at Ashland. T. J. Kauer is Director of Highways; L. F. Schaeublin is Chief Engineer; and Louis Wismar is Chief Engineer of Construction.

Highway Engineering Conference Bulletin

The proceedings of the Eleventh Annual Highway Engineering Conference sponsored by the University of Utah have now been published. The 18 papers included cover every phase of highway engineering—surveying, soils, seal coating, maintenance, roadside control, concrete-pavement construction, etc. Copies may be obtained by writing to A. Diefendorf, School of Engineering, Department of Civil Engineering, University of Utah, Salt Lake City, Utah. Enclose 50 cents to cover wrapping and mailing only.

Fennel Is 100 Years Old

The Fennel Co. of Kassel, U. S. Zone, Germany, established in 1851 to make transits and levels, is celebrating its 100th anniversary this year. Fennel originated and made the first modern transit level, theodolite, and tachymeter. Norbert Dienstfrey, New York City, is the sole agent in the U. S. for Fennel.

Texaco Marfak stays in bearings in spite of the roughest service your bulldozers, shovels, trucks and other equipment may get. *Texaco Marfak* is both adhesive and cohesive, won't pound or squeeze out, resists washout. You get longer lasting protection against wear and rust . . . positive assurance of longer parts life, lower maintenance costs.

In wheel bearings, *Texaco Marfak Heavy Duty* gives similar long-lasting protection against wear and rust . . . requires no seasonal change. It seals out dirt and moisture and seals itself in — assuring longer bearing life, as well as safer braking.

For further savings, lubricate engines — heavy-duty gasoline or Diesel—with *Texaco Ursa Oil X***. This fully detergent-dispersive oil cleans as it lubricates . . . keeps rings free, assuring better compression and combustion . . . keeps fuel consumption and maintenance costs down.

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A Study of Cofferdams

"Cofferdams", a second, revised, and enlarged edition of a text originally published in 1940, will be of great interest to the construction industry. Its authors, Lazarus White and Edmund Astley Prentis, are well known in the field, and the experience they have gained in the ten years since the first edition was published does much to increase the value of the book. As the authors point out in their preface to the second edition, construction practices are never static, and though the basic principles of working with nature and not against it remain the same, construction techniques improve from one year to the next.

The first chapter presents a review, as free as possible from mathematical theory, of the hydrodynamics of cofferdams. Here follows a study of erosion in streams and the influence of lateral earth pressures on cofferdams on land and in water. Actual design and construction features are presented by de-

tailed case studies of cofferdams which have come directly under the authors' supervision. Fifteen projects are described. Construction equipment, pumping stations, sheet piling of wood and steel, bracing systems, excavation methods, and many other detailed considerations are included.

A review of this book would not be complete without noting that the authors give careful attention to cofferdam failures as well as successes. An amazing record of such a failure is given in a series of seven pictures showing the destruction of a cofferdam on one of the upper Mississippi River dams. A man on the job happened to be standing on the service bridge of the dam with a loaded camera, and was able to make this remarkable pictorial record of cofferdam failure from beginning to end.

The new edition contains 201 photographs and drawings, and is considerably larger than the first edition. A glossary of terms and a bibliography are included. "Cofferdams" is published by

Columbia University Press, 2960 Broadway, New York 27, N. Y. Price is \$10.00.

Welding and Flame Cutting

A new illustrated catalog on a complete line of cutting, welding, and gas-air equipment has been offered by National Welding Equipment Co., 218 Fremont St., San Francisco 5, Calif. It illustrates and describes the National line and points out features of the cone-end sealing ring, needle valves, and regulators.

The folder says that the Western Pioneer outfit No. 70 can be used for every kind of welding, abrading, soldering, preheating, or flame-cutting operation in the shop or field. A variety of tips, nozzles, and attachments are available for each torch. Water-cooled nozzles, torch extensions, multiple flame-heating nozzles, and other cutting attachments are presented.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 379.



The design and housing of the Bendix MRT-5B two-way radio unit permits installation on vehicles where heavy shocks and vibration will be met.

Mobile Radio Unit

A rugged 2-way mobile radio unit for use on construction equipment has been announced by Bendix Radio Division, Bendix Aviation Corp., Baltimore 4, Md. Designed for adjacent-channel operation, the Bendix MRT-5B communications unit combines a 10 to 12-watt FM transmitter receiver and power supply in a single wraparound housing. A shockmount is provided with this new unit which will operate on any one or two radio channels in the 152 to 162-megacycle band.

The Bendix MRT-5B is said to be particularly adaptable for use by contractors because its design will permit installation on machines and vehicles where heavy shocks and vibration will be encountered. The same unit may be used at base stations as well as in mobile applications.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 343.

Cab Conditioners

Two new types of conditioners for ventilating and heating crane cabs and protecting operators from dust and fumes have been developed by Dravo Corp., Dravo Bldg., Pittsburgh 22, Pa.

The Model VHDF is designed to provide continuous ventilation, heating, dust filtering, and fume protection for crane cabs and small confined spaces in industrial plants. The other unit, Model VHD, is intended for use where noxious fumes are not a problem but where dust filtering, ventilation, or heating may be required. The conditioners can be installed on the crane cab in a horizontal, vertical, or inverted position.

For cold-weather operations, fresh air brought into the units is heated by electric strip heaters maintaining automatically controlled temperatures of between 68 and 72 degrees in the crane cab. Either unit will operate on ac or dc power.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 278.

Lightweight Scaling Tool

Bulletin 84 describing the Cleco B-1 scaling tool for removal of weld splatter, rust and paint scrapings, and general scaling work has been prepared by the Cleco Division of the Reed Roller Bit Co., P. O. Box 2119, Houston 1, Texas. Features pointed out in the circular include the swivel control valve to prevent twisting of the air hose, hand-pressure air admittance to the tool, an adjustable throttle valve controlling power, and a steady jet of exhaust air to remove chips.

Specifications on the B-1 scalers indicate that they have a bore of 1 inch and stroke of 1 1/4 inch. Hardened blank chisels, a wide spoon chisel, and wide flat chisels are available for use with the scalers. An adapter for star drills, and various-size star drills are also available. A cross-section drawing indicates the important features of the tool.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 259.

Construction Blocks...

... YOU CAN DEPEND UPON FOR REAL "PICK-UP POWER"

The enduring strength of McKISSICK CONSTRUCTION BLOCKS, with built-in lubrication, assures maintenance-free operation and long economical life.

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Box 2496 Tulsa, Oklahoma

McKISSICK

Self-Propelled Convertible Crane, Loader, and Backhoe

A new catalog on the Model 78 combination swing loader, mobile crane, and backhoe has been issued by Mandt Mfg. Co., P. O. Box 1797, Columbus 16, Ohio. The folder illustrates the quick-change conversion of this unit and includes complete specifications for the power source, attachments, and operating parts. Photographs show it on the job.

The Mandt Model 78 has a 7/8-yard capacity for loading and grading and a 2-yard capacity for working with snow. Operating as a crane, it has a 3-ton capacity without the use of outriggers. As a backhoe it may be used to dig down to depths of 10 feet, and it oper-

ates with a standard 1/2-yard-capacity bucket.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 290.

Multipurpose Conveyor

A broadside describing the Handy-Handler conveyor has been prepared by The Belt Corp., Orient, Ohio. It outlines construction features and specifications, and illustrates with small sketches the versatility of the unit for loading and unloading trucks, hoppers, and boxcars, and for transferring material to and from storage piles and conveying vehicles.

The conveyor is 16 feet long and has a 4-foot midsection which can be used

to increase the length to 20 feet. It will handle all granular materials and operate on an angle up to 45 degrees. The power unit for the Handy-Handler conveyor may be a gasoline engine or electric motor.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 367.

Hyster Promotes Moody

Robert F. Moody, who joined the Hyster Co. in 1947, is now Assistant Sales Manager in the Eastern Division, working from headquarters in Peoria, Ill., with 28 dealers and 7 district managers. Before his promotion Moody was in charge of industrial truck promotion for Hyster in Oregon.

Spirally Welded Pipe

A new bulletin has been prepared by Naylor Pipe Co., 1230 E. 92nd St., Chicago 19, Ill., on its Lockseam Spiralweld steel pipe, fittings, couplings, and accessories. It describes the major physical properties of Naylor pipe and includes a table on collapse pressure.

Typical applications it illustrates show work on construction, dredging, materials handling, etc. Standard specifications are given for pipe sizes ranging from 4 to 30 inches in diameter. Dimensions are given for the fittings and slip-on welding flanges.

This literature may be obtained from the company by requesting Bulletin 507, or by using the Request Card at page 16. Circle No. 286.

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NEW YORK—Hubbard & Floyd, Inc., 151st St. & Grand Ave., New York 51.
T. E. Potts Equipment Co., 2260 Sheridan Dr., Buffalo.
L. E. Smith, Inc., 357 W. Fayette St., Syracuse 2; 134 State St., Albany.
NORTH CAROLINA—Hampton Roads Tractor & Equipment Co., Norfolk, Virginia.
North Carolina Equipment Co., 3103 Hillboro St., Raleigh; Pineville Rd., Charlotte; Sweeten Creek Road, Asheville; P.O. Box 126, Guilford; P.O. Box 695, Wilmington.
NORTH DAKOTA—The Euclid Road Machinery Co., Hibbing, Minnesota.
OHIO—The W. W. Williams Co., 635 Goodale Blvd., Columbus 8; 18301 Brookpark Rd., Cleveland 11; 914 Main St., Cincinnati 2; 1280 Conant St., Toledo (Maumee).
OKLAHOMA—The Euclid Road Machinery Co., Dallas 1, Texas.
OREGON—Intermountain Equipment Co., Boise, Idaho.
P. L. Crooks & Co., 2145 N.W. Pettygrove St., Portland.
PENNSYLVANIA—Atlas Equipment Corp., 635 Ridge Ave., Pittsburgh 12.
Standard Equipment Co., 192 Horton St., Wilkes-Barre; Hephburn & Lycoming Sts., Williamsport.
L. E. Smith, Inc., Camp Hill (Harrisburg); 29th & Montgomery Avenue, Philadelphia.
RHODE ISLAND—Clark-Wilcox Co., Boston 34, Mass.
SOUTH CAROLINA—Southern Equipment Sales Co., Sumter Highway, Columbia.
SOUTH DAKOTA—The Euclid Road Machinery Co., Hibbing, Minnesota.
TENNESSEE—Euclid-Memphis Sales, Inc., 185 S. Butler Ave., Memphis 2.
Power Equipment Co., 1218 Island Home Ave., Knoxville; 600 W. Manning St., Chattanooga.
TEXAS—The Euclid Road Machinery Co., 2524-26 Main St., Dallas 1.
Lively Equipment Co., Albuquerque, New Mexico.
UTAH—Faulger Equipment Co., 1361 So. 2nd West, Salt Lake City 8.
VERMONT—Clark-Wilcox Co., Boston 34, Mass.
VIRGINIA—Hampton Roads Tractor & Equipment Co., W. 39th and Kilian Ave., Norfolk.
Rich Equipment Co., 1601 Chamberlayne Ave., Richmond 10; 405 Center Ave. N.W., Roanoke 7.
WASHINGTON—A. H. Cox & Co., 1757 1st Ave. South, Seattle 4; 2015 Center St., Tacoma; 313 Third Mission, Wenatchee.
P. L. Crooks & Co., Portland, Oregon.
Intermountain Equipment Co., E. 611 Sprague Ave., Spokane 9.
WEST VIRGINIA—Atlas Equipment Corp., Pittsburgh 12, Pennsylvania.
Rich Equipment Co., Kanawha Blvd., Charleston 22; East & U.S. 80, Clarkburg; P.O. Box 289, Bluefield.
L. E. Smith, Inc., Philadelphia, Penna.
WISCONSIN—Euclid-Chicago Co., Chicago 31, Illinois.
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Facts Must Back Road Claims, SASHO Is Told

Thomas H. MacDonald Reviews Road Facts, Suggests Future Policies At 9th Annual SASHO Meeting; New Officers Were Elected

♦ ABOUT 500 members of the Southeastern Association of State Highway Officials gathered in Louisville last October 5 and 6 for their ninth annual meeting. S. T. Roebuck, Chairman of the Mississippi State Highway Commission, retired as President and was succeeded by Dwight H. Bray, Chief Engi-

neer of the Kentucky Department of Highways. Mr. Bray was succeeded as Vice President by C. R. McMillan, Chief Highway Commissioner of South Carolina. And C. Walton Thompson, Statistical Engineer Economist of the Mississippi State Highway Commission, was succeeded as Secretary-Treasurer by A. O. Neiser, Director of Design of the Kentucky Highway Department.

Chief speaker at the meeting, Commissioner of Public Roads Thomas H. MacDonald, told the delegates that facts are what we need if we are to cope with current uncertainties of the highway program. In every legislative body, he said, we may assume that the balance of power tends to action in the public interest. "The *sine qua non*, when positive action is required, is the clear

presentation of convincing factual evidence of the public interest." If legislative bodies fail to provide legislation when needed to serve the public, it is generally an indictment of those whose duty it is to place recommendations before the body, properly supported by facts. Therefore it behooves highway officials to take a long realistic look at those facts.

Fallacy of "New Roads"

During the postwar period, about 82,700 miles of roads have been built with Federal Aid (20,700 miles during 1950) and about 97,000 with state funds. That is a large total, standing alone, but we have made a serious mistake, said Commissioner MacDonald, in referring to this mileage as "new roads".

They are not new. They are replacements of small fractions of our highway plant that have worn out and are not usable by increased number and weights of traffic. Neither are sections on new right-of-way "new roads" since they serve an existing and increasing traffic.

Vehicle and Ton-Miles Increasing

That traffic was about 450 billion vehicle-miles in 1950, or 50 per cent above 1940. And it will keep on growing. Even should there be wartime restrictions, only passenger-car traffic would be reduced—not truck traffic. That would increase.

Between 1940 and 1949 the mileage volume of all traffic on rural roads increased 42 per cent. But in the same period the vehicle mileage of all trucks and combinations on rural roads rose from 21.1 billion to 33.8 billion, an increase of 60 per cent. Tractor-semi-trailer and other combinations rose from 4.4 billion to 9.5 billion vehicle miles, an increase of 116 per cent.

Ton mileage on rural roads rose from 46.2 billion to 89.1 billion, an increase of 93 per cent. The load carried by combinations increased from 23.3 to 63.5 billion ton-miles, nearly tripling the 1940 figure.

Deficiencies on Interstate System

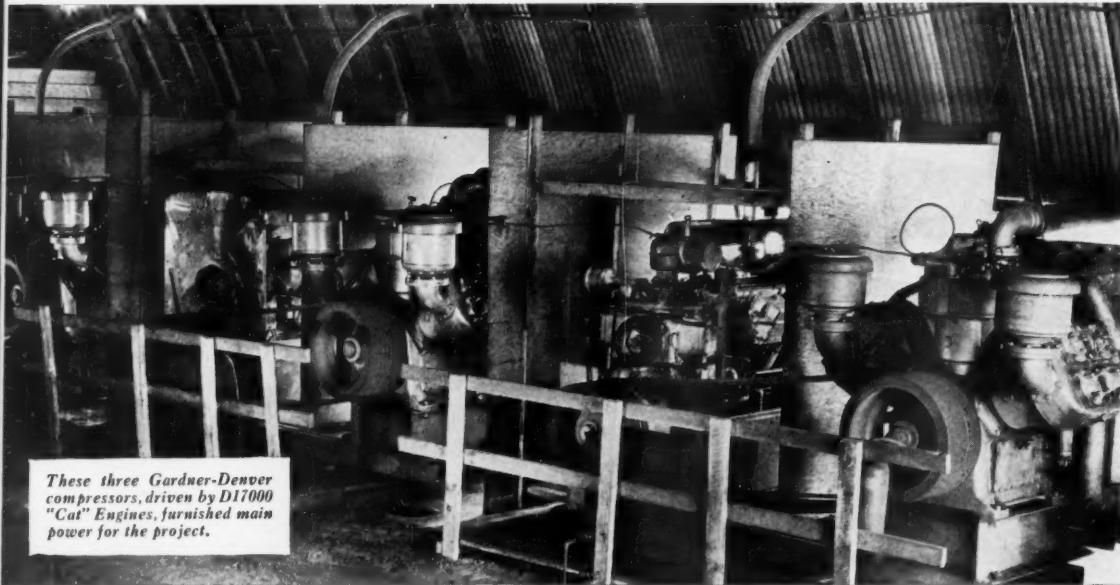
The June, 1949, report on Highway Needs for National Defense revealed that \$11,266,000,000 would be required to bring the 37,800-mile interstate system up to standards desirable for 1948 traffic. Bridges are a serious deficiency—8,234 of the 12,048 carrying the routes of the system are definitely deficient in carrying capacity. As for the road surfaces, the average mile has a surface designed in 1937 on alignment and gradient last improved in 1932. By 1959, 18,220 miles which were in service in 1948 will have worn out.

In rural areas, 9,520 miles of two-lane road require widening to 24 feet; another 875 miles need conversion to four lanes; and 1,350 miles with three or more lanes undivided need to be rebuilt as divided highways. Inadequate sight distances prevent satisfactory passing on 7,324 miles. Similar deficiencies exist in shoulder width. It is estimated that were the inadequate sections improved to adequate standards more than 1,400 lives would be saved in one year through reduction in accidents. All this on our top-flight highways!

What the Facts Imply

The implications of these facts are many. In the first place, we need a balanced program of maintenance and replacement based on a 10-year period said Mr. MacDonald. We should look at every route or section of route from the angle of its potential performance over a 10-year period. Can it be maintained for 10 years within reasonable costs? If not, it becomes a candidate for reconstruction, competing with all other projects in the same category for allocations of critical materials. It is too early to know what controls may be placed on materials needed for highway construction, but if it becomes necessary to present claims for allocation of materials, the claims must be supported by factual evidence.

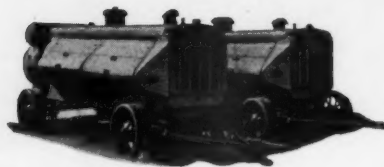
Therefore, said Mr. MacDonald, "The action which the state highway departments should now take to serve best the public interest is to make certain that the planning survey units have sufficient personnel of the most competent caliber . . . to develop and keep current a continuing inventory of the condition and requirements of the highway system, since it is through this method that we can best replace uncertainty in successfully carrying out administrative responsibilities. It is only through this method that we can hope to keep our highway system an efficient operating plant."



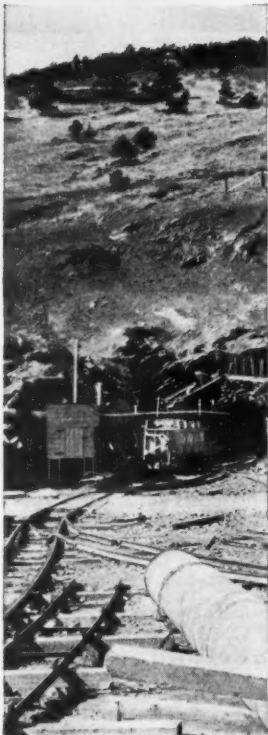
These three Gardner-Denver compressors, driven by D17000 "Cat" Engines, furnished main power for the project.

Drill Power

on the Big Thompson



Stand-by power was supplied by two portable compressors, driven by D13000 Engines.



The mouth of the Big Thompson tunnel, entering rocky hillside near Loveland, Colo.

A VITAL link in the Big Thompson water diversion project is a mile-long, 8-foot tunnel west of Loveland, Colorado.

Tarlton Construction Co., of Loveland, drove this tunnel through hard rock, and all power for drilling was supplied by "Caterpillar" Diesel Engines. Three D17000s, driving stationary Gardner-Denver compressors, were the main power source. And two portable compressors, powered by D13000 Engines, were used to round out this air compressor team.

Over the years, "Caterpillar" Diesels have built a solid reputation for durable construction, simplicity, economy, long, dependable work life and excellent dealer service. That's why they are standard power in leading makes of compressors, crushers, excavating machinery and other types of heavy-duty equipment.

Today the importance of "Caterpillar" products, both for military use and for maintaining the national economy, is greatly increased. Talk over your machinery requirements with your "Caterpillar" dealer. He has ample parts stocks to keep your present equipment doing its job and will do his utmost to make prompt delivery of new machines.

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The winner of this gold trophy will be the Flying Businessman of the Year—the Navion plane owner who logs the most flying time between November 1, 1950, and November 1, 1951. Any bets that a contractor will win it?

Flying Businessman Of '51—a Contractor?

To the nation's businessman who logs the most flying time in a Navion plane between November 1, 1950, and November 1, 1951, will go a gold trophy from the Ryan Aeronautical Co. and the title "Flying Businessman of the Year". The company is also awarding a monthly plaque to the owner with the greatest amount of executive-plane travel time for that period, and four prizes to Navion owners who will be named "Flying Businessman of the Quarter".

Ryan officials describe the average Navion owner as a contractor, manufacturer, dealer, or whatever, in his early forties. He is not interested in flying as a sport. What he wants is safe fast travel. Eighty-five per cent of his flying time is logged on strictly business trips.

For further information write to the company at Lindbergh Field, San Diego 12, Calif.

Proceedings of 1949 HRB Meeting Are Brought Out

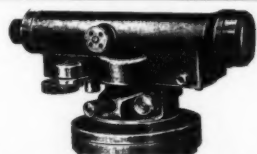
About 45 of the papers presented at the 29th Annual Meeting of the Highway Research Board in Washington, D. C., on December 13-16, 1949 are included in a book recently released by the HRB.

The 620-page book is divided into sections on Economics, Finance, and Administration; Design; Materials and Construction; Maintenance; Traffic and Operations; Soils; and a general section containing the minutes of the business meeting and a list of winners of the HRB Award for a paper of outstanding merit, the HRB Distinguished Service Award, and the George S. Bartlett Award.

The book may be obtained from the Highway Research Board, 2101 Constitution Ave., Washington 25, D. C. Enclose \$7.50 and ask for Proceedings, Vol. 29.

Directs Thew Sales

M. B. Garber is now Director of Sales for The Thew Shovel Co., Lorain, Ohio.



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J. T. Cushing is Sales Manager in charge of all domestic sales except those to the Federal government. Robert Maynard remains as Export Manager. Q. J. Winsor relinquishes his present duties as Assistant General Sales Manager and assumes a new position under the General Manager with the title of Manager of Development Sales.

A New Gravel Plant

A new addition to the Traveler series of gravel crushing, screening, and loading plants has been announced by Universal Engineering Corp., a Division of Pettibone Mulliken, Chicago. The Model CSE Traveler consists of a jaw crusher, shovel-loading hopper with reciprocating feeder and trap grate, feed conveyor, one-deck inclined gyrating screen, delivery conveyor, return bucket elevator, and power unit mounted on a steel gooseneck truck with pneumatic tires.

The CSE Traveler is designed to produce accurately sized material for road



The latest Traveler gravel plant, the CSE, is designed for "crush and travel" operations where production requirements are moderate.

building and maintenance with a single crusher in a closed circuit. Three sizes are available with 1016, 1020, or 1024 roller-bearing jaw crushers. Universal Traveler series plants are designed for "crush and travel" operations where production requirements are moderate.

Compact design, minimum weight, and portability permit them to operate in "out-of-the-way" locations wherever gravel is available, the company says.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 361.

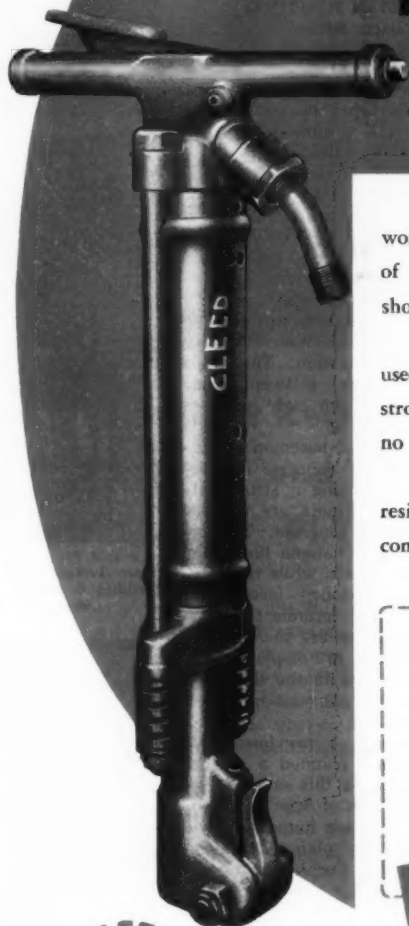
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Heart of the Cleco RC-50 is the same type Reed-Cleco valve as that used on the RC-80. This valve gives full control of both power and return strokes . . . assuring hard, uniform blows, fast action, minimum recoil, no short-stroking, and low air consumption.

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Write for Bulletin SP-849.



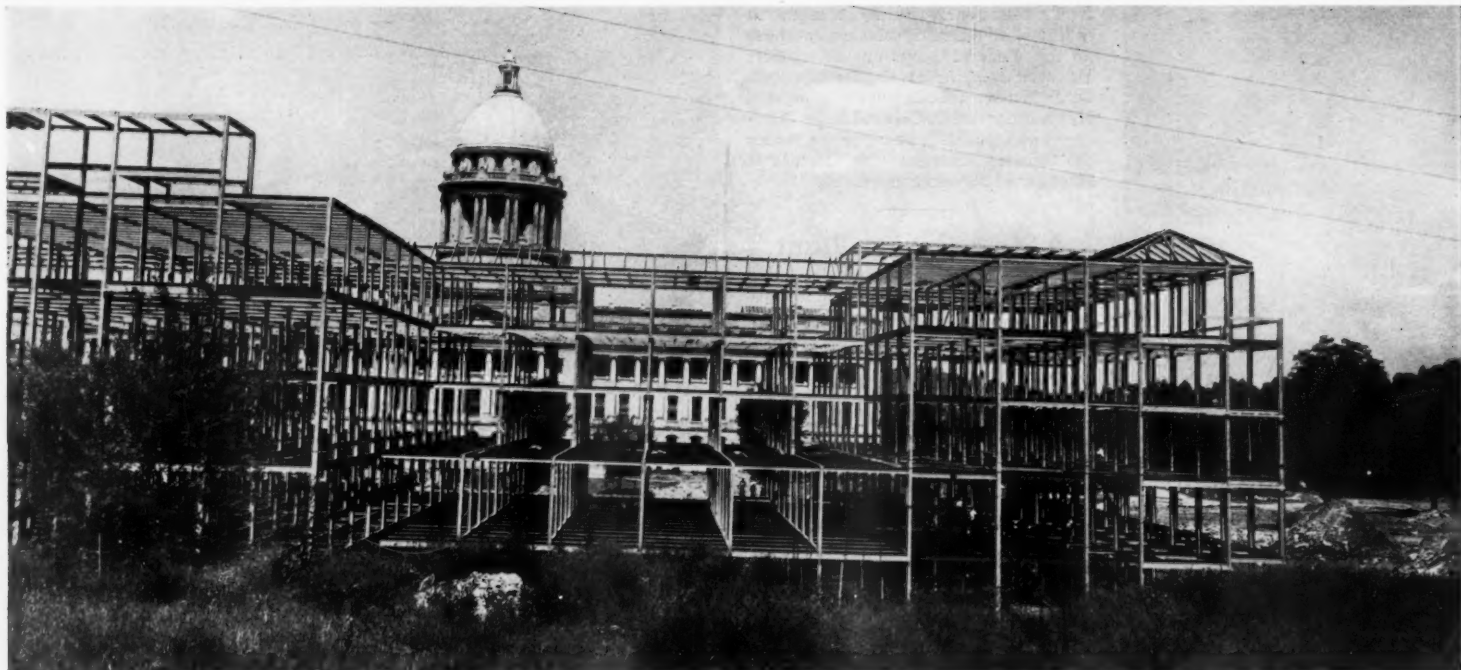
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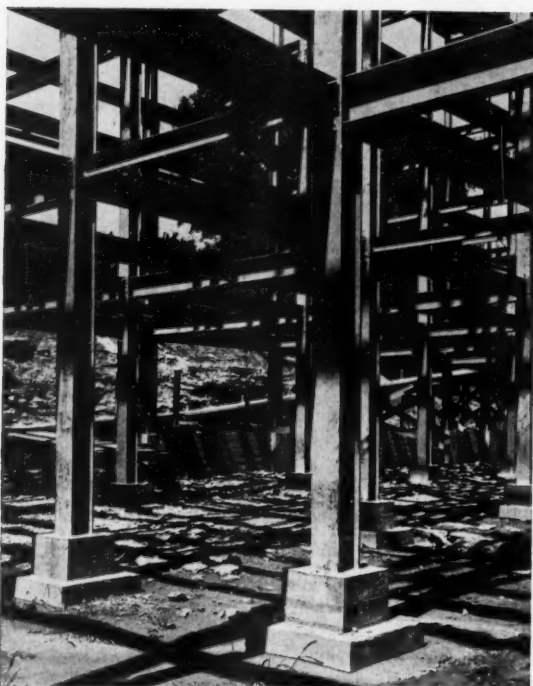
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Kentucky Builds New Annex for Capitol



C. & E. M. Photo

A typical column for the new capitol annex building in Frankfort rises out of a 3-foot-square stem and a pedestal 1 foot 9½ inches square x 15 inches deep. The footing has been backfilled.



C. & E. M. Photo

The concrete plant at the site consisted of a Winslow Binabatch and a Jaeger 11-S mixer. The cement storage shed is up above on the hillside. At right is a Bell Prime Mover.

Four-Story Office Building of Structural Steel Has Cellular Steel and Concrete Floors; to Be Faced With Stone and Brick

By WILLIAM H. QUIRK,
Eastern Editor

♦ THE Commonwealth of Kentucky is constructing a capitol annex building 300 feet to the south or rear of the state capitol in Frankfort. The new structure will relieve the present shortage of office space to accommodate state departments, many of which are now occupying rented quarters. Work on the big annex, which exceeds the capitol in size, got under way on August 24, 1949, and is scheduled for completion in 1952. Its cost of approximately \$5,000,000 will be paid for through the sale of bonds by the State Property and Buildings Commission. The bonds will be retired over a twenty-year period by rentals from state agencies occupying the building.

The four-story-and-basement building has a reinforced-concrete foundation to rock supporting a structural-steel framework. Floors are cellular steel and reinforced concrete. The exterior walls are cut Indiana limestone, granite, and face brick, while the interior walls are masonry faced with marble, plaster, and ceramic tile. Interior office partitions are the movable steel type. Ceilings are of plaster and acoustic material, while the floor finishes are asphalt tile, terrazzo, and concrete.

Three years ago a previous state administration had planned a smaller judiciary building on this same site to house the state Court of Appeals. Construction of a concrete foundation had proceeded when the plan was superseded in favor of the larger capitol annex office building. Some departments will be moved from the capitol to the annex to provide space for the courtrooms in the capitol itself. The old foundation that had been built was utilized wherever possible in the construction of the new annex.

Large Building

The new capitol annex building is a large structure with overall ground-floor dimensions of 462 feet east and west x 188 feet north and south. In addition there is a wing on the south

(Continued on next page)



C. & E. M. Photo

Here riveters work from "floats" hung from the framework of the building to make a column and beam connection at first-floor level. George H. Rommel Co. used three riveting gangs.



C. & E. M. Photo

From left to right, Office Manager W. E. Vinson, Assistant Superintendent J. B. Hoback, Curba Deen, Resident Engineer for the architects, and Superintendent Preston S. Sinton.

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end that measures 75 feet wide x 50 feet deep. Floor areas above the ground floor diminish in size due to the division of the building into wings, thus providing more light and greater outside exposures. Heat for the building will be provided by the boiler house that now services the capitol. This permits practically all the basement to be a full working floor, occupied either by offices or storage files.

Construction started after the State Property and Buildings Commission awarded contract A to the George H. Rommel Co., Inc., of Louisville, Ky., on its low bid of \$782,000. This included the demolition of the existing concrete footings and foundations that interfered with the new work, all new foundations, structural-steel framework, and such exterior services as sewers, electric lines, conduits, water mains, and steam supply lines. It also included a pedestrian underground tunnel connecting the capitol and the annex. This tunnel of reinforced concrete is 268 feet long, 10 feet wide, and 9 feet high, with its 10-inch floor slab topped by 2 inches of terrazzo. The walls and roof slab are 10 inches thick.

Foundation Problem

Excavation at the site totaled 39,700 cubic yards of earth and 13,500 cubic yards of rock. Beneath the overburden the limestone strata proved to be seamy and dotted with caves of various size that had to be filled in with lean concrete before the footings were built. The excavation attracted more than the usual interest when some large bones and teeth were discovered in the deep holes, and were identified by scientists as the remains of mastodons that once roamed this part of Kentucky many centuries ago.

The demolition and rock work was handled with Thor equipment that included two paving breakers, three jackhammers, and one wagon drill, with air supplied by the Chicago-Pneumatic 500-cfm compressor. Timken bits, from 2-inch down, were used with the drill steel. Rock was generally taken off in 6-foot lifts, with the average spacing of the drill holes on 3-foot centers both ways. Both Atlas and Du Pont 60 per cent dynamite was used in charging the holes. Because of the proximity of the capitol, the maximum charge was limited to 150 sticks of powder.

The contractor had three excavators



C. & E. M. Photo

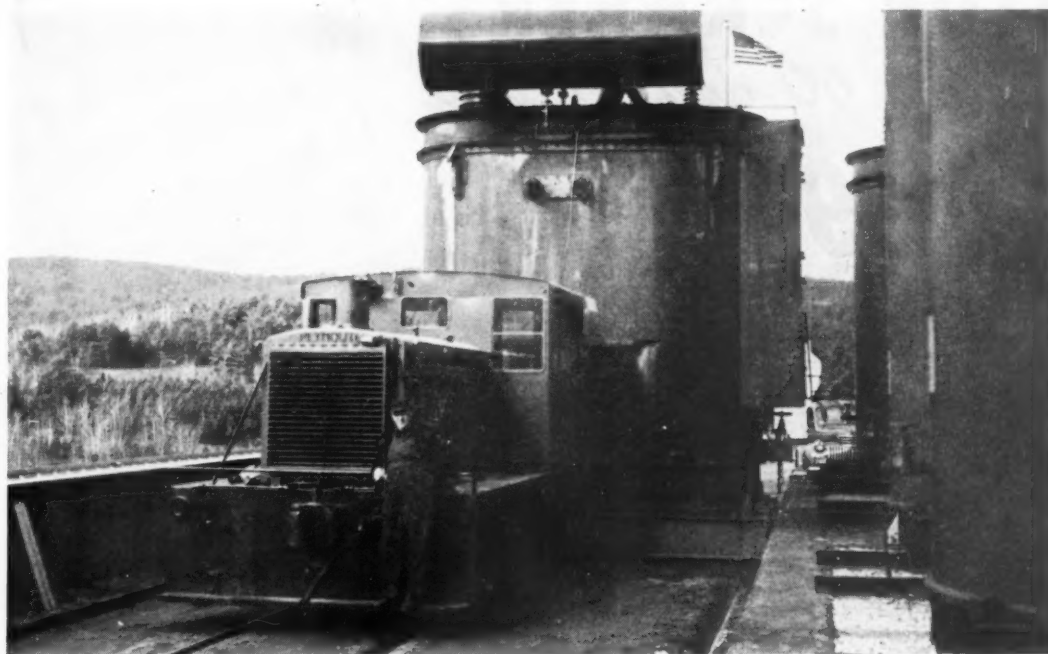
The west side of the Kentucky Capitol at Frankfort, with the new annex going up at the right.

on the job for digging, materials-handling, and other purposes—a Marion 1-yard shovel, together with a 15-B Bucyrus-Erie and a Lorain crawler rig.

The two latter were usually employed as backhoes or cranes with clamshell buckets $\frac{1}{2}$ or $\frac{3}{4}$ yard in size. Two tractor-dozers—a Caterpillar D6 and

an International TD-12—assisted in the cleanup. Trucks hauled the excavated material, not needed for backfill, away

(Continued on next page)



Another Record Proves Maximum Dependability and Minimum Maintenance of PLYMOUTH LOCOMOTIVES

Heavy hauling jobs like this are all in the day's work for this sturdy 30-ton Plymouth gasoline locomotive. Chiefly employed for general haulage of freight from main lines to the Connecticut River Power plant at East Barnet, Vt., the Plymouth Locomotive is always available for other intra-plant transportation of machinery and supplies.

Mr. H. B. Soper, division superintendent of the plant, states that in two years of service this Plymouth has never been laid up for repairs. The total amount of maintenance required, he says, consists only of regular lubrication. Hauling and switching freight cars over 3 miles

of standard gauge track, this Plymouth Locomotive has brought time-saving convenience and ease of handling to reduce hauling costs for the Connecticut River Power Co.

Plymouth Locomotives are available in standard and narrow gauge models . . . in gasoline, diesel-electric or diesel-mechanical. Every model, from 3-ton to 70-ton size, is engineered for efficient, cost-cutting operation on every hauling job. For full information on the size and model best suited for your own hauling needs write today for new catalog: Plymouth Locomotive Works, Division of The Fate-Root-Heath Co., Dept. A-12, Plymouth, Ohio.

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Kentucky Constructs An Annex for Capitol

(Continued from preceding page)

to spoil areas in the vicinity of the job site.

Concrete Footings

In some places the foundation excavation went down 30 feet below the original ground surface. Reinforced-concrete footings for the 346 columns in the building are designed for bearing pressures of 4,000 pounds to the square foot in earth, and 12,000 pounds to the square foot in rock. Most of them are founded on rock. They vary in size from 4 to 9 feet square, with the average around 5 feet; depths range

from 18 to 27 inches. They are surmounted by stems 3 feet square and with a maximum height of 17 feet where the deep holes were encountered. Base plates for the columns are set within the upper portion of the stems. Pedestals enclosing the lower part of the columns rise out of the stems. These pedestals are 1 foot 9½ inches square and 15 inches deep. The top of the basement floor slab is flush with the top of the pedestals.

All concreting was done at the site, from a plant set up along the side of a hill at one end of the building and consisting of a Winslow Binabatch and a Jaeger 11-S mixer. Sand and crushed stone for the aggregate, supplied by the Frankfort Builders Supply Co. of Frankfort, was delivered in

trucks. The material was end-dumped directly into bins above the batching unit. Bag cement from the Louisville Cement Co. at Speed, Ind., was stored in a shed on the hillside, and slid down an enclosed chute to the mixer as it was wanted. Water for the mix was obtained from a nearby city main.

Concrete was conveyed to the forms in four Bell Prime Movers and three Moto-Bugs, self-propelled buggies that were operated over timber runways. With this equipment 10 yards of concrete was placed every hour. This rate of progress was sufficient since the greatest single pour on the job was only 80 yards. The mix was designed to give a strength of 3,000 psi at 28 days. Last winter careful preparations were made for carrying on the concreting by

heating the aggregate and water, but as the weather was mild they were not required. Rain, however, constantly interfered with the progress of the work, not only through the winter but for the first seven months of 1950 when spells of dry weather were of short duration.

Form Work

Around the perimeter of the building is a concrete foundation wall from 12½ to 19 inches thick, and extending up from the grade of the column base plates to the first-floor level. Atlas steel forms were used throughout in 6 and 8-foot panel lengths that worked out nicely with the 16-foot-square bays, with the pilasters in the walls being 2 feet square. The 182 tons of steel shapes reinforcing some 4,000 cubic yards of concrete was supplied by the Pollak Steel Co. of Cincinnati, Ohio.

The only slab work in this initial contract was for the terrace floor along the front of the building at the first-floor level. The slab is 7 inches thick x 38 feet in width, and extends the full length of the north side of the annex. Forms were supported on RooShors for the slab pour.

As the concreting proceeded, the 1,750 tons of structural-steel framework was also going up. A typical column consisted of a 12-inch WF beam at the bottom decreasing to an 8-inch WF beam at the top of the building. The columns are encased in 3 inches of gypsum for fireproofing. The fabricated steel members were supplied by the International Steel Co. of Evansville, Ind., and erected by the Crawford Steel Construction Co. of Cincinnati with a Manitowoc Speedcrane. Riveting was done with from one to three riveting crews, air for the hammers being supplied by a Worthington 210-cfm compressor which pumped into a receiver. The riveters worked on "floats" hung from the framework. The steel erection was completed by the end of August, 1950, following a plan of completing four bays at a time.

Succeeding Contracts

By the end of October contract A was completed by the George H. Rommel Co., Inc., and the next and largest contract on the project got under way. This was awarded to the Struck Construction Co. of Louisville on a low bid of \$2,843,000, and is considered the general contract for finishing the building from the foundation up, including the floor slabs and closing in. The basement floor is a 7-inch concrete on slab laid on 8 inches of crushed-stone backfill.

The other levels are made up of Robertson Q-Floor, a cellular-steel subfloor, topped by a concrete slab, and having a total thickness of 7½ inches. The concrete slab is to contain radiant-heating pipes to heat the building which is also to be air-conditioned. The roof will have a 1-inch insulation course topped by a 20-year-bonded gravel surface. Suspended ceilings, covered with acoustical tile, are everywhere 10 feet above the finished floor line. All air-conditioning ducts are installed under this general contract for greater economy and more satisfactory results.

Under other contracts a moving stairs will be installed between the first and second floors; the annex will also be served by seven Otis elevators. Altogether seven different contracts will be awarded on the project, other major work including plumbing, electrical installations, heating and ventilating. Windows will be bronze, the doors of bronze and hollow steel trimmed with bronze and marble. The Indiana limestone exterior of the annex will match the appearance of the capitol. The grounds will be landscaped, and a parking lot provided for 300 cars.

(Concluded on next page)

SIX LAPLANT-CHOATE MOTOR SCRAPERS

*complete a 60 day schedule
IN 39 DAYS!*



ON Toronto's Malton Airport project, the six LaPlant-Choate Motor Scrapers owned by Armstrong Bros. Construction cut schedule time by one third!

The job called for moving 325,000 cu. yds. of heavy clay over a 1000-ft. one-way haul, and approximately 100,000 cu. yds. over a 4200-ft. one-way haul. On the 1000-ft. haul each Motor Scraper averaged 15 loads per hour with an average pay load of 14 cu. yds. On the 4200-ft. haul each unit averaged 7.9 loads per hour with an average 13.5 cu. yd. pay load. These fast 4 and 7.5 minute cycles are typical of the big production features of the fast-stepping, power-packed LPC Motor Scraper.

Your LPC distributor can show you Motor Scrapers at work. When you call him, ask him to tell you about the new, larger engines—either the Buda 280 h.p. or Cummins 275 h.p. Diesel, that give you more usable power and speed for schedule-trimming production. LaPlant-Choate Manufacturing Company, Inc., Cedar Rapids, Iowa—LaPlant-Choate Sales and Service, 1022 77th Ave., Oakland, Calif.

"On the Malton Airport job in Toronto, we had 60 days to move 426,000 cu. yds. of dirt. Our six LPC Motor Scrapers finished the job in 39 days! We're buying three additional units to help us move dirt faster on future big jobs."

ELGIN ARMSTRONG
Armstrong Bros. Construction
Brampton, Ontario

LAPLANT CHOATE



Cable-operated Scrapers in 6-, 8- and 14-yd. sizes for all makes of track-type tractors.



2- and 4-yd. Scrapers for track-type and rubber-tired industrial tractors.



Hydraulic and Cable-operated Dozers.

Self-P...
CENT...
P...
Engine...
many...
perform...
for spe...
RICE...
220 M.

Personnel

The capitol annex building was designed by Meriwether, Marye & Associates, Architects and Engineers, with Proctor & Ingels handling the mechanical, and Porter J. White the structural features of the design. All are from Lexington, Ky.

Personnel for the George H. Rommel Co., Inc., included Preston S. Sinton, Superintendent; J. R. Hoback, Assistant Superintendent; and W. E. Vinson, Office Manager. At the peak of its construction the firm averaged 115 employees.

Construction of the building is under the supervision of the State Property and Buildings Commission, Division of Engineering, of which J. B. Rieman is Executive Secretary and Chief Engineer. Curba Deen is Resident Engineer for the Architects. Lawrence Wetherby is Governor of the Commonwealth of Kentucky.

New Fuel Admixture Aids Motor Starting

A new fuel admixture, Startrite, designed to improve engine operation in winter, has been developed by Motor Kool Products Co., Inc., Columbus 8, Ohio.

The company states that moisture will collect in fuel-storage tanks under almost any conditions, and that this moisture when transferred into the engine fuel line will freeze under adverse weather conditions. The company claims that Startrite has the ability to unlock the molecules of gasoline and of water so that they will unite into a complete solution. The water will therefore go with the gasoline and not collect in low spots in the gas line and freeze. This product is also said to dissolve gum and varnishes found in gasoline. Startrite is available in pint and gallon sizes, and also in 55-gallon drums.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 311.

General-Use Tool Box

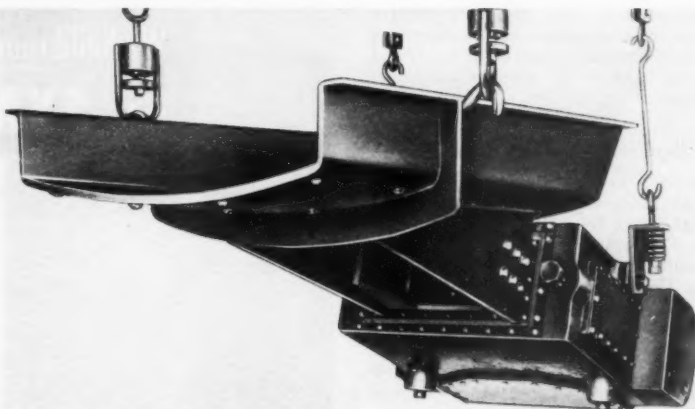
A new line of tool boxes designed to meet most requirements is marketed by Lyon Metal Products, Inc., Aurora, Ill. There is a general-purpose utility box which is made to hold an average assortment of tools used by most workmen, the company says. The cantilever tray has five compartments and swings to one side as the top is opened, leaving ample space to reach the contents of the box. The spring on the padlock hasp forces it tight over the staple whenever the top is closed. The box cannot be opened accidentally when being handled, says Lyon. Several other models are also available.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 389.

Dust-Tight Feeders

A new vibratory feeder has been developed by Syntron Co., 227 Lexington Ave., Homer City, Pa. The new Vibra-Flow feeder is said to be dust-free.

Working parts—leaf springs, armatures, and core—are covered by gasket-sealed



Working parts of the new Syntron vibratory feeder are covered by gasket-sealed plates bolted to the magnet casting to keep them dust-free.

plates bolted to the magnet casting.

By enclosing these parts, protection is obtained against clogging by excessive hopper spillage or heavy dust conditions. This makes the feeder suitable

for class 2, group installations, the manufacturer reports. The sealed protection is said not to affect the feed rate, which ranges up to hundreds of tons per hour of bulk material. The

feeders may be used for dry or damp, hot or cold, fine or coarse materials.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 337.

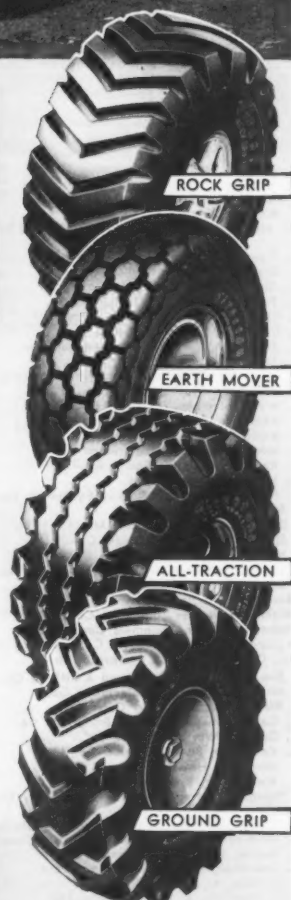
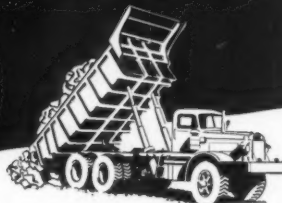
Water-Repellents

A series of pocket-sized circulars describing water-repellent coatings has been announced by Hydrozo Products, Inc., 3230 University Ave., Madison 5, Wis. These products, designed for sealing timber and masonry surfaces, both wall and roof, contain Hydrozo, which is said to penetrate deep into porous material, leaving a heavy mineral gum deposit that keeps out moisture. The coatings may be applied with either a brush or a spray to any surface, the circulars say. Complete information on the properties and applications of each of the products is contained in the circulars.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 375.



Firestone TIRES



TIRES used in rock work, strip mining, and earth moving have to face a terrific amount of torture. Whether they make or lose money depends on how well and how long they can take that torture.

Firestone tires can TAKE it. Time and again they break old performance records, set new records for long service. Such performance is no accident. The extra tough, job-designed treads and the all-rayon Gum-Dipped cord bodies—protected by four extra impact plies and extra-thick sidewalls—explain why Firestone tires turn in better work and turn out more work.

Not far from your project there's a Firestone Dealer or Store organization prepared to handle your complete tire needs and lower your operating cost. They will welcome the opportunity to call on you and show how this can be done.

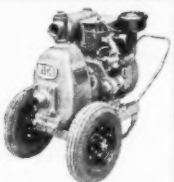
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220 N. Milwaukee St. Grafton, Wis.

For Truck-Mixer Drivers

The National Ready Mixed Concrete Association has released a booklet for truck-mixer drivers called "Your Job", prepared by a special committee of which W. E. Clark of Dravo Corp. was Chairman. "Your Job" is amusingly illustrated. In a friendly colloquial manner it outlines the job of a truck-mixer driver—his responsibility for customer relations, the quality of the mix, discharge, care of the truck, and safe driving; and the action he should take in case of emergencies and special problems. Blank pages are provided so that a company may include in the booklet information on its policies in regard to uniform care, sickness and hospitalization benefits, safe-driving bonuses, etc.

Copies may be obtained from the National Ready Mixed Concrete Association, 1325 E Street, N. W., Washington 4, D. C. Members of the Association pay \$1.00 each for 25 copies or less, 90 cents each for 26 to 100 copies, and 75

cents each for any amount over 100. Rates to nonmembers are double those quoted. Company names will be printed on the booklet for a slight additional charge.

Double-Impeller Breaker

A new 8-page bulletin about the Cedarapids double-impeller impact breaker has been issued by Iowa Mfg. Co., Cedar Rapids, Iowa. The breaker, recently acquired from New Holland Mfg. Co., has been improved by Iowa. The bulletin gives "the inside story of double-impeller impact-breaker action", describing how the breaker achieves high-capacity production of cubical-shaped aggregate with low power requirements. Construction features are illustrated and described in detail. Dimensions and specifications are included.

This literature may be obtained from the company by requesting Bulletin IMP-1, or by using the Request Card at page 16. Circle No. 279.

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Simple sturdy hardware means fast erection and fast stripping. Without nails, forms last twice as long. Contractors report substantial savings in labor and material costs as well as important savings in time.

Panel with steel ribs every 12 inches are recommended for heavy pressure. Ribs allow 1500 pounds pressure per square foot.

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SEAMAN MIXER
easily handles 12 inches compacted roadway depth.

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True, it's rather seldom that conditions call for depths of such an extent to attain the required load-bearing value but it is an outstanding example of the versatility offered by the SEAMAN method of in-place processing.

There's a SEAMAN MIXER for every requirement—whether your job is a 2 inch mat, an extensive highway project—or another "Cone Bros." problem. And that also holds true for every type of binder and aggregate.

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SEAMAN Deep Mix Model equipped with hexagonal solid welded rotor and powered with 180 H.P. 6 cyl. diesel engine.

SEAMAN MOTORS, INC.

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New Diesel-Electric Prime Mover Is Out

A machine which has no clutch, no transmission, and no differential, and which incorporates a new method of power transmission for heavy-construction equipment—this describes the new electric-drive Tournatow announced by R. G. LeTourneau, Inc., Peoria, Ill.

The Tournatow is powered by a GMC 6-cylinder 2-cycle diesel engine which can develop 186 hp at 1,800 rpm. Two generators, one ac and one dc, are mounted in line with the engine. The dc generator supplies power to each of the four drive wheels; this power is applied indirectly through a potentiometer-type rheostat for precision control. The ac generator supplies power to each of the two motors used to steer the front and rear wheels, and to the motor operating the heavy-duty winch on the rear of the unit; this power is controlled by individual switches on the control panel. The power plant is held in position by four mounting bolts and can be removed easily for overhaul.

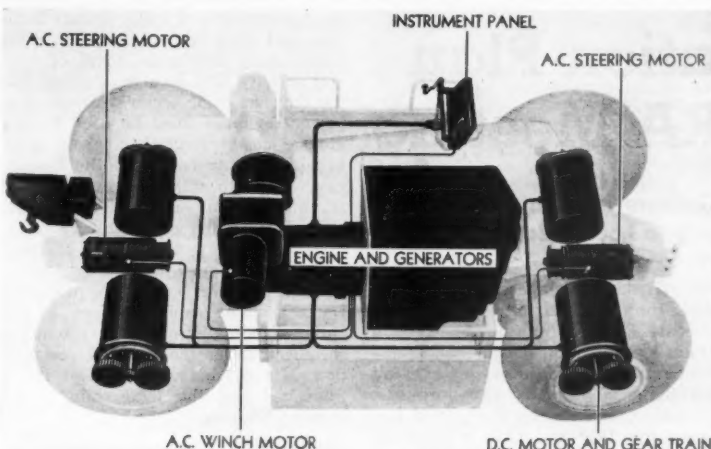
Connection between the Tournatow's power plant and the motors—drive, steering, and winch—is through flexible electric conductors, and the motors are placed at the points of application. This eliminates intermediate and final drive gears and shafts, differential, transmission, universal joints, hydraulic braking system, and other mechanical gearing and linkages.

Operation of the Tournatow is simple. The throttle for its diesel engine is advanced to turn the generators at the required speed. The flow of electric current from the generators to the wheels is regulated through the potentiometer which permits infinite variation in speed up to 25 mph.

Features claimed for the Tournatow are its ability to develop a smooth start, a smooth pull, and quick and easy stops. A power stop is accomplished by returning the controller to the off position. The manufacturer also states that after the diesel engine has been started and the throttle opened, no further use of the engine throttle is necessary. The unit is steered by push buttons. The operator can obtain forward and reverse or left and right movement by rotating the controller. He can obtain left or right movement of the front or rear wheels for simple left and right turns; or turn of both front and rear wheels in the same direction for movement oblique to the axis of the machine; or for very short turns (under 14 feet), front and rear wheels steer in opposite directions.

Each drive wheel is suspended on ball-and-socket type of bearings with drive motor, reduction-gear train, drive gear, and wheel built as a single unit. Tires are 56-inch standard aircraft type. Wheels have only four moving parts—pinion, two reduction gears, and internal gear—and are interchangeable. Limit switches automatically cut off the steering motors when the wheels have reached their limit of turn.

The winch is separately controlled by a fingertip switch on the control panel. The Timken-bearing self-aligning LeTourneau patented fairlead bracket on the rear of the machine's frame structure permits pulls through a 180-degree arc, with an allowable side pull of 90



This photo-diagram of the Tournatow shows how the electric current generated by its diesel engine and in-line generators is conducted to each of its four wheels and to the steering mechanisms.

degrees from the axis of the machine. The ac motor and reduction-gear box can deliver 30,000-pound line pull through the $\frac{3}{4}$ -inch cable and line

speeds of 60 fpm, LeTourneau says. The automatic brake on the winch motor holds the load instantly when the operator releases the control switch. A 12-cubic-foot compressor, driven by the Tournatow's diesel engine, may be used to supply compressed air. A compressed-air storage tank is mounted at the front of the machine. A 50-foot air hose on a spring reel is included in the accessories for servicing equipment which requires compressed air.

With its combined ac and dc systems, the Tournatow can be used as a standby power plant. Welding equipment, lighting facilities, and other electrical units can be easily handled by the large-capacity in-line generators.

The Tournatow can carry 5 men in addition to the operator, and can be equipped with a cab for winter operation. The cab is designed for quick removal, being held in position by four cap screws.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 355.

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- Gets buckets heaping full
- Reaches farther and higher
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THE SHOVELLOADER OPERATOR IS SAFE... Just ask any operator. He will tell you he prefers Shovel loader safety because he is clear of falling rocks and moving mechanism.

MANY ATTACHMENTS are also available for the Lull Shovel loader to make it a continuous worker, month after month, regardless of weather. In addition to a wide range of material buckets, special buckets for pavement ripping and concrete can be mounted quickly when needed. Sweepers, log lifting forks, crane attachments, and bulldozer keep your Shovel loader working the year around. You can put them on in a jiffy.

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New Reclamation Plan Urged at NRA Meeting

"Man on the Land" Movement Gathers Momentum as Dana Urges Transfer of Controls Back to Local Water Users

By RAYMOND P. DAY,
Western Editor

THE National Reclamation Association has taken under advisement a new plan of reclamation, designed to reverse the trend toward political bureaucracy and return control of soil and water to the man on the land.

The new plan was presented by Marshall Dana, a past President of the organization and Chairman of the Basin Development Committee appointed last February by NRA President Harry

Polk. Dana explained the details of MOL—for "Man on the Land"—to 875 delegates to the Association's 19th Annual Convention in Spokane, November 15-17. Delegates took Dana's plan under advisement in the form of a resolution, and during the period between the 1950 and 1951 conventions will study the plan thoroughly with a view toward calling officially for its adoption.

MOL, Dana explained, is essentially a private-enterprise approach to river-valley authority, with power stemming from the farmers and people rather than from Washington, D. C. In almost every phase it is in direct conflict to the Columbia Valley Administration type proposed by the Department of Interior. Here are the main features:

1. Water users in each state should own the water rights.
2. Rivers flowing within only one state should be developed under the laws of the state, and not those of the Federal government.
3. Interstate compacts should be erected with the consent and participation of the Federal government, to govern basin developments affecting more than one state. Each state legislature involved should ratify the compact before it is submitted to Congress for approval. Local interests should be represented especially and fully in the interstate compact. The compact should make all decisions on basin development and initiate all action, subject to the will of Congress.

Basin Account to Pool Revenue

A pooling of all revenue of the various projects within each river basin would be accomplished with what Dana called a "basin accounting system". Under this new bookkeeping system, reclamation projects in the basin could be considered essential if the overall benefits obtained from power plants, flood control, and other factors were on the credit side of the ledger. Subsidies would be applied to irrigation costs in excess of what settlers could pay, only when the projects paid for themselves. Otherwise subsidies would not be applied for.

Dana said that the administration of the basin account "should not be given to any one agency, specifically, the Department of Interior, nor should any one agency be given exclusive authority over rates for electric power."

Dana said explicitly that MOL would not interfere with Federal functions of flood control, navigation, conservation,

the construction of locks, harbor facilities, and other responsibilities that fall traditionally within the scope of Federal activity. But he also admitted that the day has come when hydroelectric-power revenues must be used to help finance costly multiple-purpose projects, and Dana called on the Federal government to withdraw as owner and administrator of both water resources and power when contractual obligations for repayment have been satisfied.

Terming the new program a "positive answer" to TVA and CVA proposals, Dana accused cabinet offices in the national administration of promoting socialism under the guise of reclamation. Minutes before, President Harry Polk had said the same thing in his opening address.

Cites Power Shortage

A definite shortage of firm power is so acute in the Pacific northwest, Polk said, that unless more power is soon developed, rigid restrictions may become necessary. Tracing the growth of

reclamation projects through the days of simple irrigation, beyond the multiple-purpose project to the present basin-wide concept, Polk said that hydroelectric power had now come of age as a working partner to irrigation. In fact, many of tomorrow's projects cannot be built unless some supplemental form of financing is devised. In addition to endorsing the Basin Accounting System advocated by Dana later, Polk said that the cause of reclamation would be helped if states assumed added responsibility, including construction responsibility wherever possible for the development of their water resources. Also, with the exception of extensive, basin-wide, multiple-purpose projects, some of the larger undertakings might be built through access to open money markets.

But real efficiency in reclamation cannot come about, Polk pointed out, until its control is once more in the hands of local people. He called for quick decentralization of power in

(Continued on next page)

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Washington, and for the transfer of title on all projects to the water users when the projects were paid out. And repayment features must be limited to what the water users can pay, he said.

In this connection, Polk told of seven major Missouri Basin projects which have been completed in the past 6 years since the Pick-Sloan Plan was approved, but he said that only one repayment contract had so far been successfully negotiated, because of what he termed "uncompromising insistence by the Bureau of Reclamation for terms to which water users could not possibly comply."

Solons Urge Unity

Unity and straight thinking are necessary if the reclamation program is to move forward, Congressional representatives told the convention. Congressional speakers included Wayne Aspinall, Congressman from Colorado; Arthur V. Watkins, Senator from Utah; and Guy Cordon, Senator from Oregon and a member of the Senate Interior and Insular Affairs Committee.

Cordon especially blueprinted a program of sound reclamation development. The day has come to face the fact that reclamation must be partly financed by other parts of the nation besides the 17 western reclamation states. Unless reclamation sets its house in order speedily, and arrives at the best possible solution to reclamation problems, there is real danger that the rest of the country might withdraw support from the program, he said.

Soil Conservation Stressed

The vital necessity for considering soil conservation much more seriously in both reclamation and flood control was voiced by speaker after speaker, including Commissioner of Reclamation Michael W. Straus, Major General Lewis A. Pick, Chief of Army Engineers, and John Geoffrey Will, General Counsel to the Upper Colorado River Commission. General Pick painted a vivid word picture of desolate parts of the world which were once the Garden of Eden, and traced their downfall to a disregard for soil, water, and other resources.

"Stop this muddy, nasty runoff by tying down the soil with improved farming," General Pick pleaded. "Let's make our rivers flow clear, or nearly so."

General Pick, tracing America's role of world leader, forecast a 300,000,000 population by the year 2050, and predicted the largest construction boom the world has ever seen if this country meets its destiny in years to come. Pick defended in principle the importation of minerals, oil, iron ore, and other resources from abroad to conserve our own, and said that the harbor development and navigation program of the Corps of Engineers was already paying off handsomely in that regard.

The importance of soil in the water picture came up for discussion in an address by Commissioner of Reclamation Michael W. Straus. Saying there is no reason for any reclamationist to be critical of soil conservation or watershed control, Straus added, "If there is not better watershed protection and soil practice, the good reservoirs we build to save and hold water lose space to silt faster than necessary. Reclamation wants that soil and silt held on the watershed and not running into our reservoirs. It's just as simple and selfish as that. But the way to meet that problem is to speed up soil conservation and watershed practice and not hold back the pacemaker, which is Reclamation."

Straus Comments on MOL

Although Straus had no direct answer to MOL in his prepared speech, he told CONTRACTORS AND ENGINEERS MONTHLY in an interview that he was somewhat puzzled at the new plan and had not had time to study it thoroughly.

"MOL would indicate a return to state and local control," he said, "but the reason the Reclamation Law was passed in the first place was because the states said they were not big enough to do the job."

Straus urged more unity in the NRA, and touched off an explosion of protest by accusing California and Texas affiliates of becoming "apostles of the status quo", and positively opposing further development under Reclamation Law. He defined "apostles of the status quo" as "those who have water, sit tight on it, and to hell with anybody who hasn't got water or wants new water developed."

The storm of floor requests for recognition was put aside by the convention Chairman, but at the close of business an answer was made by J. E. Sturrock, Austin, Texas, who set the delegates straight by explaining that delay to Canadian River and other Texas reclamation projects was caused by the Department of Interior itself, through its failure to obtain state recommendations

through the Texas Governor's office. Sturrock told the delegates also that Straus had "lied" to Texas rice farmers regarding the 160-acre limitation, and asked, "What can you do when you've got Federal officials like that?" He was greeted by a roar of applause.

"Grass Roots" Discussions

In a "grass roots" discussion on Water Users' Day, five speakers from as many

districts spoke of reclamation problems in their areas. R. D. Searles, President of the Salt River Valley Water Users' Association from Scottsdale, Ariz., reported that rainfall has now been increased approximately 20 per cent through artificially induced rainfall. Seeding by dry ice and silver iodide was reported by Searles, who said that generally speaking, silver-iodide

(Concluded on next page)



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New Reclamation Plan Urged at NRA Meeting

(Continued from preceding page)

ground dispensers were much less expensive than artificial seeding from planes.

Other "grass roots" speakers voiced the convention theme of more home rule by demanding an end to bureaucracy and tinkering with established reclamation. George N. Skoegard, President of California's Fresno Irrigation District, said the most serious problem affecting Central California's independent irrigation districts is how to combat the threat of absorption by the Bureau of Reclamation. Skoegard accused the Bureau of "falsehood", and "working overtime with its propaganda machine", in connection with the Bureau's statement that integration of the Kings River Project with the Central Valley Project will make more water available to the small farmers of Kings River.

More general aspects of land reclamation were told in addresses by Kenneth Cheadle of Spokane, who spoke on basin-wide reclamation development, and by Regional Director H. T. Nelson of the USBR, who pinpointed the challenge of the Columbia River Basin.

Resolutions and Officers

As an indication of the complexity and seriousness of the reclamation situation, over 50 resolutions were offered, resulting in 39 that were adopted by the convention. Among the most important were an affirmative endorsement for study of Dana's MOL program, and a flat declaration against valley authorities or other such Federal administrations. The basin accounting system was urged in another resolution, and the 160-acre limitation on established lands under the Reclamation Law was pinpointed for repeal by Congress. All Federal agencies should be subject to state water laws, said the Association, and the United States

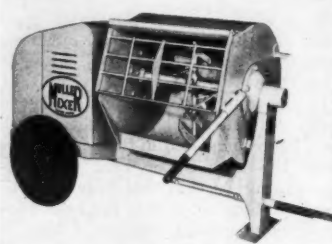
should consent to court proceedings in connection with water rights in state courts.

A committee was set up to suggest a time limit on the tenure of officers in the NRA, but for the coming year Harry E. Polk of Williston, N. Dak., will continue as President of NRA. Judge Clifford H. Stone of Denver will be First Vice President, with C. Petrus Peterson as Treasurer and William E. Welsh as Secretary-Manager.

The 1951 convention is to be held in Amarillo, Texas, some time in November.

Athey Promotions

The Athey Products Corp. of Chicago has promoted two men in its sales organization. Tom Shea, former District Representative in 13 northeastern states and eastern Canada, is now General Sales Manager. A. T. Marchuk has been promoted from Assistant Domestic Sales Manager to Domestic Sales Manager.



Easy to handle, charge, and transport, the new Muller plaster and mortar mixer has a 6-cubic-foot capacity.

Plaster-Mortar Mixer

A new 6-cubic-foot-capacity plaster and mortar mixer is announced by Muller Machinery Co., Inc., Metuchen, N.J. Known as the Utility Type, this new model is designed along modern lines to effect easier handling around the job as well as transportation from one job to another. It has a low charging height for convenient loading and is regularly equipped with a bag splitter and a safety grate, the company points out.

Standard power equipment for the unit is a Briggs & Stratton air-cooled gasoline engine which drives through a roller chain and machine-cut gears. Drive is furnished either with or without clutch. Wheels are disk type equipped with 4.00 x 12 pneumatic tires and roller bearings. Special wheels are available for narrow doorways.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 292.

Pocket Electrode Guide

A new 56-page electrode guide, covering all P&H welding electrodes, has been prepared by Harnischfeger Corp., Welding Division, 4400 W. National Ave., Milwaukee 14, Wis. Of pocket size for easy reference, the guide has page tabs marking the various classifications of electrodes. A helpful feature is the 2-page comparative chart which lists corresponding types of electrodes. The booklet also includes a description of each electrode, typical applications, and the sizes which are available.

This literature may be obtained from the company by requesting Bulletin R7-8, or by using the Request Card at page 16. Circle No. 325.

Gardner-Denver in Canada

Gardner-Denver Co., Quincy, Ill., manufacturer of rock drills, air compressors, pumps, and equipment for mining, contracting, and industrial purposes, is building a plant at Brantford, Ontario, Canada, to be operated by the Gardner-Denver Co. (Canada) Ltd. Key production men will be temporarily transferred from the parent plant at Quincy to provide necessary initial supervision, but both skilled and unskilled labor will be obtained in Canada.

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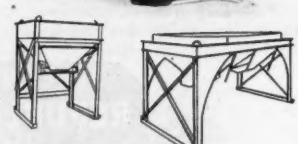
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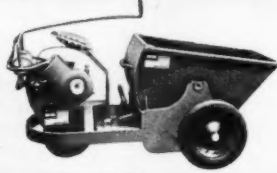
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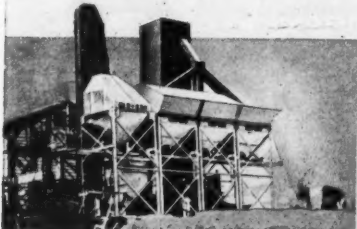
Barrows

complete line (35 models) with steel or aluminum trays and with wood or steel handles.

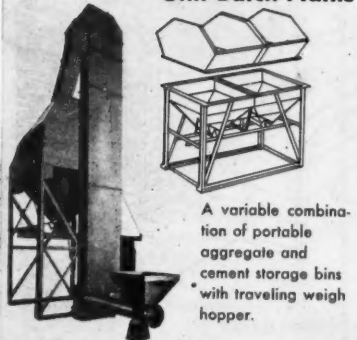


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Big Alaska Program Planned This Year

This year ushers in the biggest construction program ever undertaken in Alaska. State-side contractors should not miss this opportunity.

So said Col. L. E. Seeman, Alaska District Engineer of the Army Corps of Engineers, as he addressed 160 contractors from southern California and Arizona in Los Angeles, November 27. The meeting, in Los Angeles District headquarters, was one of four which Col. Seeman is holding in the United States to stir up contractor interest in the Alaska program. He spoke also at Seattle, Portland, and Dallas.

Unless the world situation changes rapidly, Col. Seeman said, the Alaska construction outlook seems bright for at least 4 years. In 1950 alone much work was done, he said, but the Alaska engineer pointed to astronomical items in the 1951 program. Jobs totaling \$86,000,000 will be let at Fort Richardson and Elmendorf Air Force Base. Another \$31,500,000 will be spent at Ladd Air Force Base, while Eilson Air Force Base gets \$38,500,000 in new contracts. The work will cover everything from housing and the installation of utilities to pavements and parking aprons.

Col. Seeman told the contractors about all problems peculiar to Alaska construction. Mobilization for any job must be done in the United States, he said, because Alaska has no private economy which would permit a contractor to buy supplies extensively within the Territory. It is a rule of thumb that a dollar will go only half as far in Alaska as it will in the States, and Col. Seeman told how camps had to charge \$5.75 per man per day for board and room, and then lost money.

He urged contractors to explore thoroughly local labor agreements. New wage rate patterns typically Alaskan have recently gone into effect, he pointed out. For example, the current per-hourly labor wage is \$2.435, while shovel operators get \$3.27 and plumbers get \$3.50. Alaska has a fair reservoir of available labor, but it is still necessary to import help during the peak summer construction program.

The Alaska construction season has certain advantages, Col. Seeman pointed out. In summer there is practically unbroken daylight, making night work unnecessary if a contractor wants to work 24 hours. The construction season for outside work begins in April and lasts until November, but inside work—barracks and housing interiors, for example—goes on all winter. It is not uncommon to turn housing facilities over to the using agency in January or February.

The Alaska District is preparing plans and specifications so bids can be called in late fall and winter, thus enabling the lucky contractors to use the spring months for mobilization and preparation for the jobs. Little if any cost-plus-a-fixed-fee work is planned. Instead, unit bid prices prevail, and Seeman urged contractors in the southern California region to join in the competition.

Already, contract firms from Oklahoma, Texas, and Missouri have performed Alaska work, he said.

Permafrost is generally found north of the Alaska mountain range. In places it is up to 90 feet deep. Where building foundations have to be placed over permafrost, Col. Seeman told how the frozen material is thawed by steam pipes to a depth of about 60 feet, and then consolidated by dynamite charges. South of the mountains, permafrost presents no major problems.

Contractors interested in bidding work under the coming Corps of Engineers annual program can secure further information and invitations through The District Engineer, Corps of Engineers, Alaska District, Anchorage, Alaska. Communications can also be addressed to the Seattle Division, Alaska District, 504 Securities Bldg., Seattle, Wash.

age, Alaska. Communications can also be addressed to the Seattle Division, Alaska District, 504 Securities Bldg., Seattle, Wash.

36th Annual Road School Proceedings Are Published

The eighteen papers presented at the 36th Annual Road School sponsored by Purdue University have been compiled and edited by Ben H. Petty, Professor of Highway Engineering, and published by the Purdue Engineering Extension Department. Copies may be obtained by writing to University Editor's Office, Purdue University, Lafayette, Ind.

New Dietz Man in South

Frank E. Smith has retired after 55 years of service with the R. E. Dietz Co., Syracuse, N. Y., manufacturer of lanterns and road torches. Alfred Miller succeeds him in charge of the southern territory—the twelve southern states from Virginia to Texas.

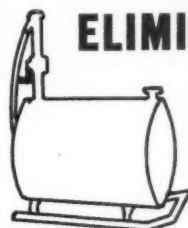
Water-Power Equipment

A 76-page fully illustrated brochure on water-power equipment and its installation has been prepared by the Newport News Shipbuilding & Dry Dock Co., Newport News, Va. The booklet illustrates and describes some 36 different plant installations made in the United States.

Output of the company in the water-

power-equipment field includes hydraulic turbines, butterfly valves, pressure regulators, penstocks, regulating gates, and trash rakes. The booklet shows closeups of these individual pieces of equipment and overall plant views. It also pictures the hydraulic laboratory operated by the company.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 380.



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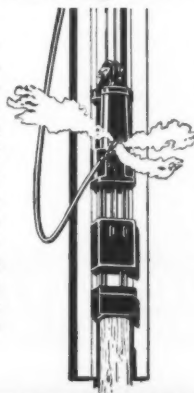
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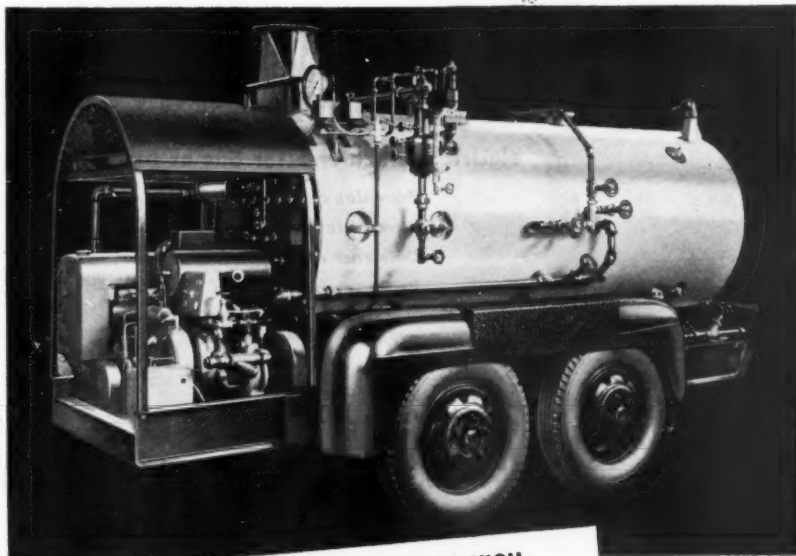
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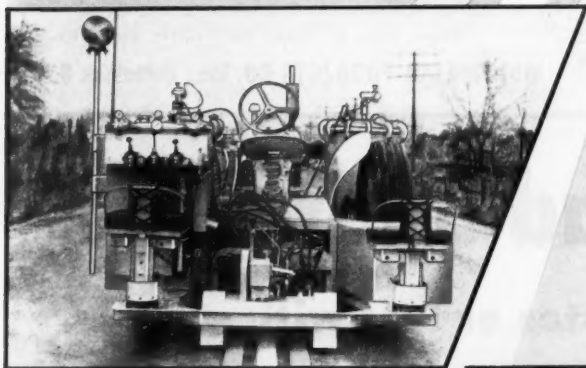
Describes Breaker Balls, Pile Hammers, Line Weights

A new bulletin on pile hammers and follow blocks, breaker balls, and line weights has been issued by The Eagle Iron Works, 159 Holcomb Ave., Des Moines, Iowa. It illustrates and de-

scribes each product and provides brief specifications. It gives instructions for replacing, in the field, breaker-ball hooks which have sheared or broken, so that the ball need not be scrapped.

Bulletin 950 may be obtained from the company or use the Request Card at page 16. Circle No. 289.

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Theory and Design Of Flexural Members

A new text on the basic theory of flexure as applied to the design of members in bending has been authored by Jamison Vawter and James G. Clark, Professors of Civil Engineering at the University of Illinois. "Elementary Theory and Design of Flexural Members" covers the major structural materials: steel, timber, and concrete. The text shows that the same basic laws govern any of the common materials, though certain peculiarities of various materials are taken into consideration—for example, the effects of time yield on reinforced concrete.

The introduction covers the design of structures in general, and such topics as dead and live loads, and impacts. Pure bending in homogeneous symmetrical sections is considered next, with emphasis on bending in symmetrical beams, bending stresses in rectangular beams, flexural formula, and shear in beams. In treating bending in non-homogeneous symmetrical beams, the authors highlight the relation between modulus of elasticity and stress, transformed sections, and shear in nonhomogeneous beams.

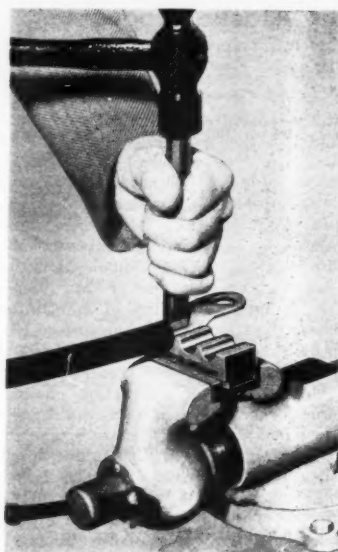
A complete discussion is provided of the elementary design of steel beams and girders, with detailed information on lateral forces, stiffener spacing, beam and girder connections, and welded girders. This is followed by a section on the design of reinforced-concrete beams and columns. The last two chapters are concerned with bending in unsymmetrical sections and in special beams. Illustrative examples and problems are incorporated in each chapter.

This text is available from John Wiley & Sons, Inc., 440 Fourth Ave., New York 16, N. Y. The price is \$4.00.

Shelving and Parts Bin

A 16-page catalog listing many types of steel shelving, parts bins, and other shop equipment has been prepared by Precision Equipment Co., 3714 N. Milwaukee Ave., Chicago 41, Ill. Descriptions, illustrations, and prices are given for steel shelving, clothing lockers, parts bins, steel drawers, blueprint cabinets, desk files, drafting chairs, steel trucks, and workbenches.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 372.



Tweco developed this block-and-punch kit for attaching copper lugs and splicers to welding cables without soldering.

New Quick-Set Kit For Lugs and Splicers

A new kit consisting of a block and punch has been developed by Tweco Products Co., P. O. Box 666, Wichita 1, Kans., for attaching copper lugs and splicers to welding cables without soldering. The kit includes a special round-end punch and triple-saddle back-up block. The saddles of the block will accept all sizes of Twecolugs and splicers.

To use this tool, the end of the cable is stripped and inserted in the correct-size lug or splicer and then placed in the saddle of the block. The barrel of the lug or splicer is then impacted into the cable strands, using the special tool-steel punch that goes with the set. The impacted copper-to-copper contact assures maximum conductivity and strength, Tweco says. It also overcomes the problems connected with soldering. This kit is for use with the solder-type Twecolugs and Tweco lug-set splicers which are specially designed for welding cables.

Further information may be obtained from the company by requesting Circular No. SL 51. Or use the Request Card at page 16. Circle No. 382.

Hydraulic Steering Booster

A 4-page folder describing hydraulic power steering for heavy-duty General Motors trucks is available from Garrison Mfg. Co., 1506 S. Santa Fe Ave., Los Angeles 21, Calif. It points out that hydraulic power boosters improve the flexibility of the truck, ease steering effort, and add safety. It explains that mechanical steering is in effect at all times and that the hydraulic power is applied only when additional pressure is required on the wheels.

The folder illustrates the installation of the Garrison power steering booster and offers a drawing of the power cylinder, control-valve assembly, and reservoir tank mounted in position.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 314.

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By BILL QUIRK

Pile-Driving Man from Providence

WHEN Charley Guild was captain of the high-school ice-hockey team in Walpole, Mass., a Boston suburb, he usually tried to sweep the opposition from his path by sheer force and drive. Now as head of the C. L. Guild Construction Co., Inc., of East Providence, R. I., he still makes use of that same force and drive in bringing his construction contracts to a successful completion. Drive is a good word to use in describing Guild (rhymes with wild) for at only 42 he is a pile-driving man whose methods have been closely watched by more than one of the long-established pile-driving companies in this country.

Besides heading his own firm, Guild is one of four partners in the Pneumatic Pile Co. of New York, which has opened up the field for small contractors to step in and compete successfully for work that had generally gone uncontested to the big pile-driving operators. The key to all this is a pneumatic mandrel by which a thin-gage corrugated-metal shell is driven into the ground, and then filled with concrete. The cast-in-place concrete pile thus obtained can take great loads and yet, because of the thin metal employed, is low in cost.

At present, Guild is driving all the piles for the structures on the Olneyville Expressway, a 1.7-mile urban artery being built through one of the most heavily congested portions of Providence. His bids for the subcontract work were low on all three sections. The prime contracts total nearly \$6,000,000, while Guild's pile work comes to around \$500,000. When contract 1 of the project was started, the pneumatic mandrel device, new to New England, was neither recognized nor accepted. But after test piles showed more than satisfactory results under heavy loads, the new method was written into the specifications for contracts 2 and 3, and was also declared eligible for the pile work remaining on contract 1.

On the Go

Guild is no swivel-chair contractor. He lives an intense energetic life, ever on the go, and seldom settles down for long in one place. He is a wiry six-footer at a husky 192 pounds, with sandy hair and blue eyes. His movements are quick, and his voice has the staccato quality of a machine gun, punctuated at times with overtones of salty talk that is descriptive and to the point. He has an easy faculty of getting along well with all types of people and makes friends readily.

Charley Guild got into the construction industry early in life. During the



C. & E. M. Photo
Charley Guild is no swivel-chair contractor. We chained him down while we took this picture.

summer vacation after his junior year at Walpole High School, the athletic youth toiled as a laborer in a construc-

tion gang. After graduation he worked for a while as a hod carrier, then served an apprenticeship in the carpenter's trade. As a full-fledged carpenter he felt he could still learn a lot about building so he dropped the hammer and saw and enrolled for a two-year course in architectural construction at Wentworth Institute in Boston.

The technical training paid off, for shortly after resuming work Guild became a carpenter foreman and then, when he was only 23, Superintendent of construction for R. H. Sewell, a building contractor. From 1931 to 1945 Guild served as superintendent for several New England contracting firms engaged primarily in heavy construction—bridges, pile driving, pipelines, sewage and water plants, and the like.

In 1937 he came to Providence as Superintendent for Capaldi Brothers Construction Co. on the construction of a sewage-treatment plant. Guild has made Rhode Island his base of operations ever since. Like many a construc-

(Continued on next page)

Announcing 2 GREAT NEW HIGH CLEARANCE CRAWLERS

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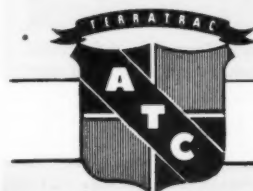
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A Pile-Driving Man From Providence, R. I.

(Continued from preceding page)

tion superintendent he often thought of having his own business. By that time, however, World War II was in full blast, and Guild was busy on assorted war work such as building underground tanks at the U. S. Navy Yard in Charlestown, Mass., or installing subsurface facilities in connection with radar detection on several small islands off the eastern shore of Long Island.

Own Business

"I was not interested in getting mixed up with war contracts on my own," Guild recalls, "but as soon as V-J day finally arrived in September, 1945, I resigned as Superintendent for Campanella & Cardi Construction Co. and went into business for myself. There really hasn't been much difference in my work as a construction superintendent and my present role as a contractor. I worked just as hard then as I do now for myself, but now the entire responsibility of a contract is mine."

From a humble start as contractor in 1945, Guild has been completely independent, owning his company "lock, stock, and barrel" as he puts it. His first job was building a private dock near Scituate, R. I., which was followed by a Quincy, Mass., sewer contract with the pipeline laid out in a bay on piles. Then came bridge and foundation jobs involving pile work in nearly every instance. The new contractor has kept himself busy for the past five years, mostly in public-works construction.

At present, besides the half-million-dollar subcontract on the Olneyville Expressway, Guild has two projects in East Providence—a \$1,100,000 sewer job and a \$110,000 filtration plant—together with \$50,000 worth of private work. He began operations with a single small crane, but now has five rigs, the largest being a Lima 802 on which is mounted an 85-foot boom and 128-foot steel leads.

River Site

Guild's headquarters on a 10-acre site off Water Street in East Providence have a 600-foot frontage along the Seekonk River. The property contains an office building, a garage for servicing his 22 trucks, two storage sheds, and a dock. He has just completed building a



C. & E. M. Photo

Guild's headquarters are on a 10-acre site off Water Street in East Providence. Here he is beside one of his 22 trucks.

modern new home in East Providence where he lives with his wife Betty and his two children—Betty Jane, 16, and John, 10.

Two years ago Guild met Walter Cobi, a New York consulting engineer who had helped design the intricate Pulaski Skyway for the New Jersey State Highway Department. Cobi had developed a pneumatic mandrel for driving thin-gage corrugated shells into the ground at low cost. Guild realized the possibilities of the pneumatic mandrel to small contractors who hitherto had been prevented from taking on large pile-driving jobs because of the great financial backing that was needed to obtain that kind of work. He went in with Cobi and two others to form the Pneumatic Pile Co. of New York, with headquarters in the Grand Central Terminal Building. Guild holds exclusive license in New England for driving this type of pile. Inquiries have been coming in from points as far away as Texas relative to this new wrinkle in

(Concluded on next page)

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pile driving.

The first commercial use by Guild of the pneumatic mandrel was in 1949, when he drove the foundation piles for an addition to a sewage-treatment plant in West Haven, Conn. C. W. Blakeslee & Sons of New Haven, contractor for over 100 years, held the general contract on the project and expressed satisfaction with the driving of some 180 cast-in-place piles, 60 feet and over in length.

Now, as subcontractor to M. A. Gammino Co. of Providence on the Olneyville Expressway, Guild is driving over 150,000 linear feet of piles. On the first section his bid price was \$5.25 per linear foot for driving conventional heavy-shell tapered steel piles to be filled with concrete. When the use of the thin-gage pile shells driven by pneumatic mandrel was approved for sections 2 and 3, Guild's price of \$3.00 a foot underbid several well known pile-driving outfits. This low bid meant a considerable savings in the cost of this new highway.

Pneumatic Mandrel

In preparing a driving rig for doing the work, Guild's long experience with construction equipment was invaluable. He mounted a 50-hp boiler with twin oil burners on the back of his Lima 802. His 128-foot steel leads were custom-built, and are attached to the 85-foot crane boom with a special trunnion that Guild developed to eliminate torsion. Long leads are necessary to contain both the thin-gage corrugated pile shells that come in single lengths up to 60 feet, and the 60-foot-long pneumatic mandrel that slips inside the uniform 12-inch-diameter 18-gage shells.

In its collapsed state the mandrel is $\frac{3}{4}$ inch smaller in diameter than the inside diameter of the shell. To inflate the mandrel, Guild has used both nitrogen, carried in tanks on the crane, and compressed air, supplied by a small compressor on the rig at a pressure of 125 psi. This expands the mandrel so that it presses against the inside of the shell, forming one unit for driving. Piles with 30-ton bearing capacity were specified on the Olneyville job. When the shell is driven, the mandrel is collapsed by releasing the air and is then withdrawn, while the shell is filled with concrete to form a cast-in-place pile. For lengths greater than 60 feet, Guild first drives a 10 $\frac{1}{4}$ -inch OD spiral welded steel pipe of the required length; then the pneumatic mandrel, with the Hel-Cor shell on it, is placed on top of the pipe and the driving completed. The connection between the shell and pipe is formed by a sleeve welded to the shell and forming a drive fit into the pipe.

Performance Counts

Although Guild has able supervisory personnel among his 100 employees, nearly all of whom are regular year-round workers, he personally supervises all current work himself. To do this he reverses the customary trend of contractors who keep in touch with various jobs by telephone from headquarters. Guild has a radio telephone in his car, and talks with his office as he rushes from job to job. Rushes is a mild word, for Guild is a hard man on an automobile, and is not one to spare tires, gas, or oil.

Good tools and equipment are one of his obsessions. He has been known to fret over the poor condition in which a borrowed saw was returned to him, while the upholstery on his new car, to say nothing of his clothes, may be covered with grease from equipment parts he had just replaced in one of his rigs. Guild likes to supervise every major repair or alteration to a piece of equipment, and getting dirtied in the process is no concern. Performance, not appearance, is what counts with him.

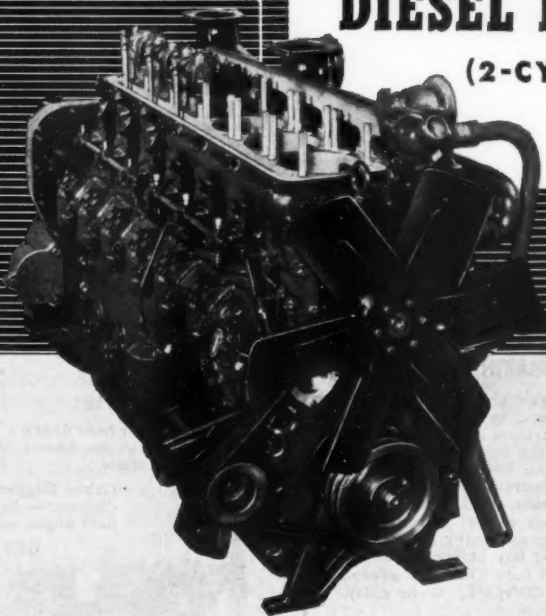
According to the telephone directory, Providence, R. I., with a population of 254,000, has 320 contractors. This must be well nigh the saturation mark for any city, with one contractor for every 794 residents. How Charley Guild crashed this formidable front, and in only five years built up a contracting business that is now handling work totaling seven figures, is no small achievement. The pile-driving man from Providence has certainly rung the bell—and got more than just a good cigar for his effort.



A Cat D7 bulldozer clears rubble from a washed-out roadbed on Highway 140 between Mariposa, Calif., and Yosemite National Park. Heavy rains last fall caused the Merced River to go on rampage, flooding out roadbeds, resort areas, rail lines, and bridges.

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the original patent of Charles Good-year. But it wasn't until last November that Rubber Avenue became, in fact, a rubber avenue.

The street was resurfaced then with a combination of asphalt and malleable rubber compound developed by Naugatuck Chemical Division of the U. S.

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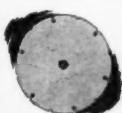
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Rubber Co. Local highway officials expect the pavement to give twice the wear of straight asphalt resurfacing material, since the rubber will keep water from seeping into the lower layers.

Portable Gas Torch

A new heavy-duty portable gas torch for heating, melting, thawing, and drying has been developed by Hauck Mfg. Co., 124-136 Tenth St., Brooklyn 15, N. Y. It will operate with compressed air at 40 psi or more, and is designed to burn manufactured, mixed, natural, propane, or butane gas.

Built without coils, the torch requires no preheating or preliminary warming to start. According to the manufacturer, it will light instantly and burn steadily. It generates a heat of 2,700 degrees F. flame temperature, and is not affected by wind or weather. It is available in five different models with maximum flame lengths ranging from 18 to 48 inches. The flame size of each torch is adjustable over a wide range. Materials used in the Hauck portable gas torch are steel, heat-resistant cast iron, and brass. The unit is furnished with heavy bronze gas and air cocks with union connections.

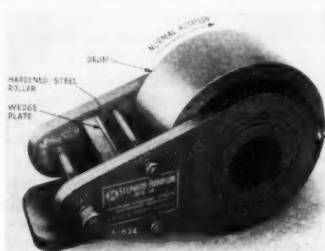
Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 309.

Small-Sized Winch

A new all-purpose hand winch for use with wire or manila rope has been brought out by Moline Iron Works, 130 Second St., Moline, Ill. It holds up to 90 feet of $\frac{3}{4}$ -inch wire rope. One man with one line can handle up to 400 pounds; with two lines and blocks, up to 800 pounds, the company says. The puller has a safety extension thumb release on the dog which engages the ratchet, an 8-toothed ratchet to permit accurate load placement, and a grip which revolves with the hand.

The company has also announced the development of a new heavy-duty gin block (well wheel) fitted with Hyatt roller bearings for easy operation with heavy loads. The block has a 10-inch-diameter wheel and is designed to take $\frac{3}{8}$ or 1-inch manila rope or smaller wire rope.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 395.



When power is interrupted, this S-A roller-type holdback prevents inclined conveyors and bucket elevators from reversing. Stephens-Adamson makes it.

Stops Load Reversal During Power Cut-Out

The new S-A normal-duty roller-type holdback developed by Stephens-Adamson Mfg. Co., Aurora, Ill., is designed to keep inclined conveyors and bucket elevators from reversing when power is interrupted. A hardened-steel roller floats between a wedge plate and a drum keyed to the headshaft. When the headshaft starts to rotate in reverse, due to power failure, the hardened-steel roller is immediately wedged between the drum and the plate, stopping motion gently and without shock. When power is re-applied, the holdback releases immediately.

This roller-type holdback is claimed to be more positive than the ratchet-type which necessarily allows some back-travel. At the same time, there is less chance for dust, dirt, and corrosion to cause the roller-type holdback to fail, the manufacturer reports.

Further information may be secured from the company by requesting Bulletin 444-A. Or use the Request Card at page 16. Circle No. 329.

Two-Shoe Hydraulic Brake

An 8-page folder describing the quality and characteristics of Dual-Primary brakes for air and hydraulic brake performance on all types of commercial vehicles has been prepared by The Timken-Detroit Axle Co., Detroit 32, Mich. The booklet describes the construction and efficiency of these brakes. Cutaway photos and cross-section drawings illustrate their design.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 264.

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Avoid Legal Pitfalls

Edited by A. L. H. STREET, Attorney-at-Law

These brief abstracts of court decisions may aid you. Local ordinances or state laws may alter conditions in your community. If in doubt consult your own attorney.

Government's Liability For Accidental Injuries

THE PROBLEM: Through negligent failure of a Government contractor to maintain sufficient warning at a detour where a culvert was being constructed on an "access road" to a military-camp project, a Government truck carrying civilian employees overturned. Two of the employees were injured and one was killed. The contractor was sued for the injuries and death, and settled with claimants. Assuming that the driver of the truck, a Government employee, was guilty of careless driving that equally contributed to the accident, would the Government be bound to reimburse the contractor for part of the damages?

THE ANSWER: No, but under some circumstances the Government may be required to stand part of the damages resulting from joint negligence. (Brown & Root, Inc. v. United States, 92 Fed. Supp. 257, decided by the United States District Court, Southern District of Texas, Houston Division.)

Here is the gist of the court's conclusions: Generally, where negligence of two parties combines to injure a third person and one is compelled to pay the entire damages, he is entitled to "contribution"—reimbursement—from the other party, for his share of the damages. This rule is applicable to the Government where it is chargeable with negligence that renders it liable under the Federal Tort Claims Act.

In this case the contractor was negligent in failing to maintain lights on the barricade at the detour—the accident occurred at night—and the driver of the truck was negligent in failing to have his truck under proper control. But, under Texas law, the contractor was not entitled to reimbursement from the Government because the driver was under no obligation to the contractor to drive the truck carefully, and because the contractor and the driver were equally at fault. (The court recognizes that, in other states where there is no statute like the Texas statute, one negligent party can require reimbursement from the other although the fault is equal.)

Furthermore, the contractor was not entitled to reimbursement for damages paid under a voluntary settlement and not under compulsion of a court judgment.

Also, since the Government paid one of the injured men workmen's compensation on account of the accident, that relieved the Government from liability to him in damages, either directly or indirectly.

Another defense: Under Texas law the Government was not liable for injury to passengers in the truck—fellow servants of the driver who contributed to their injury—and therefore there was no basis for reimbursing the contractor as to those injuries.

Dredging Contractors—Validity of State Tax

THE PROBLEM: Was double taxation unconstitutional imposed upon a dredging contractor operating in state navigable waters by levying a state tax on dredging power generated by the dredges' engines, in addition to a license tax imposed upon the gross receipts of the contractor's business done within the state?

THE ANSWER: No. (State v. Standard Dredging Corp., 43 So. 2d 909, decided by the Louisiana Supreme Court.)

In this case involving a New York dredging company that did business in Louisiana, the court noted that the usual test of unconstitutional double taxation is whether both taxes are imposed upon the same thing. Here there was one tax for the privilege of doing business in the state and a separate one based on the use of power in conducting that business.

Resistance of the power tax rested mainly on the fact that the dredges operated under licenses issued by the Federal Bureau of Inspection and Navigation. The court recognized that the State could not tax the privilege of navigating waters within the state, but there was no tax imposed upon power developed to navigate the dredges. The tax that was levied was against power used in dredging.

War Did Not Automatically Terminate Highway Contract

THE PROBLEM: Only six days after Pearl Harbor, a state highway contract was signed. Could the contractor excuse failure to finish the job on the ground that war rendered performance of the contract impossible by cutting off an expected material supply and automatically terminating the contract?

THE ANSWER: No. (Glens Falls Indemnity Co. v. Perscallo, 216 Pac. 2d 567, decided by

the California District Court of Appeal, Second District.)

The court said: "If the possibility of governmental regulation is reasonably foreseeable there can be no commercial frustration of a contract. Mere difficulty, or unusual or unexpected expense, does not establish frustration or impossibility of performance of a contract. . . . For months before Pearl Harbor any American citizen should have been able to foresee the imminence of war with the axis powers. So the defense of commercial frustration does not help the defendant—the contractor—under the facts in this case."

Wartime-Priority Delays

THE PROBLEM: The Government's priority system during World War II hampered a contractor in securing necessary materials. Was the contractor entitled to damages due to resulting delays?

THE ANSWER: No, said the United States

Court of Claims in the case of J. J. Kelly Co. v. United States, 69 Fed. Supp. 117: "The priority system was an essential wartime policy. It was an act of sovereignty which was applied on a national scale to essential materials, and since the Government was acting in this capacity it is not liable to the contractor for any damages due to that system."

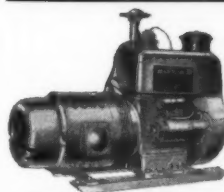
In an earlier similar case, the Court of Claims noted that there had been no arbitrary action to a contractor's prejudice in issuing priority ratings; and that, because there was no provision in the contract for a

particular rating, the contractor was bound to contemplate the results of the rating granted. (J. F. Barbour & Sons, 63 Fed. Supp. 349.)

Insurance Covers Upset Truck

THE PROBLEM: A truck-trailer was unloading fine slag. As the trailer was hoisted in front, all the slag on one side ran out. The resulting weight on the other side caused the trailer to tip over, and it was damaged as it came in contact with the ground. Was the owner entitled to insurance coverage? (Concluded on next page)

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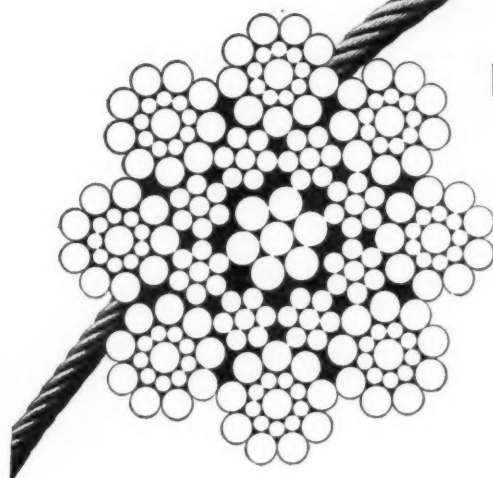
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Avoid Legal Pitfalls

(Continued from preceding page)

titled to collect on an insurance policy covering "direct and accidental . . . damage to the automobile caused by . . . upset?"

THE ANSWER: Yes. (*Radella v. Bankers Mutual Fire Ins. Co.*, 70 Atl. 2d 407, decided by the Pennsylvania Superior Court.)

The court said that because the policy did not limit the kinds of upsets that it covered, the insurance company was liable. The court rejected a contention that negligent hoisting of the trailer, causing the load to shift, was the cause of the damage and not the upset.

Disallowance for Mud Condition Was Improper

THE PROBLEM: Lock and guide-wall construction on a Federal project involved unwatering the area within a cofferdam. It was supposed that the unwatering could be accomplished by using wellpoints, but unex-

pected subterranean water conditions encountered called for other means. The contracting officer authorized auxiliary use of sumps and pumps. But that did not suffice to unwater the area, and the contractor had to use heavy mats as a foundation for machinery and for men working in the mud. That greatly increased the cost of doing the work.

The contractor called upon the contracting officer to make an equitable adjustment under the "Changed Conditions" clause (Art. 4) of the standard contract form. The officer's finding that the contractor was bound to foresee what happened was overruled by the head of the department, who, however, later found that the area could have been unwatered by using twice as many wellpoints as had been originally contemplated. On that basis \$89,936.57 was allowed, with a 21-day extension of time for performance. But nothing was allowed for the extra cost of doing the work in mud. Was the decision in the latter respect so arbitrary and capricious as to empower the United States Court of Claims to make equitable allowance?

THE ANSWER: Yes. (*Great Lakes Dredge & Dock Co. v. United States*, 90 F. Supp. 963, decided by the United States Court of Claims.)

The court said that because the contracting officer had approved the use of sumps and pumps, in lieu of wellpoints, he was "wholly unjustified in computing the equitable adjustment . . . on the basis of the use of additional wellpoints, instead of the use of the method he had approved [sumps and pumps] and in assuming that by the use of these additional wellpoints the area could have been satisfactorily unwatered. He should have made an adjustment based upon the conditions under which the work was actually done."

The court said, however, that the contractor's right to an extra allowance must be limited by being based upon a finding of the head of the department "that the latent conditions encountered which entitle plaintiff to an equitable adjustment were those conditions resulting from the fact that it had encountered ground water under hydrostatic pressure . . . to a degree not contemplated by the specifications and in such concentration as to constitute a change in latent conditions within the meaning of article 4 of the contract. There is no showing that this finding of the head of the department was arbitrary or capricious or grossly erroneous."

Right to Sue the Government

THE PROBLEM: If the Government arbitrarily violates its obligations under a construction contract, can it invoke the general rule that it is immune from suit when the contractor claims damages?

THE ANSWER: No. (*Ottiger v. United States*, 88 Fed. Supp. 881, decided by the United States Court of Claims.)

The conclusions reached by the court go beyond the facts of the particular case, which dealt with wartime labor control. A levee construction contract required the contractor to use labor referred from the United States Employment Service. Because of an alleged but not actual labor dispute, the Government refused to refer any workmen to the contractor. Result: the contractor sustained heavy damage through necessary use of unskilled and inadequate labor.

The court said that the contract implied that the Government's employment office would treat the contractors "considerately and equitably", and then said what is broadly applicable to all Government contracts: "We think that when agents of the Government, without justification in statute, executive order, administrative discretion or otherwise, engage in conduct which is a violation of an express or implied provision of a Government contract, the mantle of sovereignty does not give the Government immunity from suit. It needs no such immunity in order to be able to go on governing wisely and as circumstances require without being hampered by its outstanding contracts. We think that to treat every act of a Government agent, done in the name of the Government, as an act of sovereignty within the meaning of the doctrine here under discussion would be a retreat, without reason, from the purpose of the statute permitting citizens to sue the United States for breach of contract."

Boy Drowns in Abandoned Pit; Owner Is Not Liable

THE PROBLEM: An abandoned gravel pit filled with water through its proximity to a river. Was the owner of the pit liable for drowning of a trespassing nine-year-old boy who was attracted by a raft floating on the pond?

THE ANSWER: No. (*Bass v. Quinn-Robbins Co., Inc.*, 216 Pac. 2d 944, decided by the Idaho Supreme Court.) The court said:

ON-THE-JOB CUTTING OF REINFORCING ROD Made Easy!

NEW MANCO "GUILLOTINE"

Big-capacity, self-contained portable hydraulic cutter with "C" frame open anvil. Also cuts chain and steel rod, as well as square and hex-shaped material. Other models to cut wire rope, cable.

Easy hydraulic hand pump action (similar to bicycle pump). Operator uses his weight, not his strength, to make cut. Positive automatic blade retraction.

Latest type oil seals positively prevent leakage at both maximum pressure and no pressure. Safety-relief valve prevents overloading.



Model 20-A Integral Hand Pump

PORTABLE, HYDRAULIC

CUTS 3/4" REINFORCING ROD

CUTS 1" LOG CHAIN

WEIGHS ONLY 45 LBS.

AVAILABLE WITH COMPRESSED AIR PUMP 200 CUTS PER HOUR

Press pedal for automatic cutting. Air hydraulic pump assembly operates off any source of compressed air supplying 100 lbs. pressure. Uses 16 cubic feet per minute.



Model 20-D Compressed Air Hydraulic Pump

REPRESENTATIVES

Several good territories available on Manco Guillotine line. Please give complete statement of qualifications when writing.

See your Industrial Distributor, or SEND COUPON For Complete Information and Prices

MANCO MFG. CO. BRADLEY, ILLINOIS

MANCO MANUFACTURING CO. Bradley, Illinois

CE-1

Gentlemen:

Please send me complete information and prices on The Manco Guillotine.

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HERE'S WHY:

You get **more work** out of a bucket that holds steady and is back in position **quicker** for another bite. Rud-O-Matic Taglines have ample coil spring power to provide constant tension for steadying the largest clamshell buckets at any angle of the boom.

You get **lower costs** through faster operation coupled with Rud-O-Matic's trouble-free service. No pins, weights or tracks to get out of whack, only the simplest of working parts. Compact — and easy to install on any crane.

Rud-O-Matic Taglines are made in 8 models for all bucket sizes, and are supplied with cable and installation equipment.

Immediate delivery from your nearby equipment dealer — or send coupon below for details.



I'd like more information on Rud-O-Matic Taglines. Send literature and complete details.

Name _____

Company _____

Address _____

City _____

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McCAFFREY-RUDDOCK Tagline CORPORATION

2131 East 25th Street • Los Angeles 58, California

"There are too many pits, pools, ponds, and sloughs along the rivers and streams . . . to hold that the owners should be expected to fill or drain them, or to maintain watchmen, or to build impenetrable barriers to keep trespassing children from them. Such accidents are tragic, but fortunately they are not frequent in relation to the number of boys exposed to the risk."

Government Inspectors

Cannot Sue for Accident

THE PROBLEM: A contract to construct a floodwall for the Government required the contractor, for the safety of "employees in the performance of the contract", to comply with a code of "Safety Requirements for Excavation — Buildings — Construction", approved by the Chief of Engineers. Was a Government inspector who was injured in the course of the work an "employee" in such sense as to be entitled to sue the contractor for damages for alleged breach of the safety requirements?

THE ANSWER: No. (*Rosell v. Barcus*, 89 Fed. 2d 234, decided by the United States Court of Claims.)

The court said that clearly the inspector was not a beneficiary of the contract clause, there being no explicit or implied agreement such as was required to constitute him an employee of the contractor.

Hold FAST MIX SCHEDULES with VILTER Refrigeration

When concrete or its ingredients must be chilled to meet rigid specifications, don't use old-fashioned methods. Modern Vilter Refrigeration is today helping Dam Project Contractors fulfill contract requirements with fast mixing schedules. Missing a mix schedule by as little as a single minute per mix costs you money. Be certain of your profits with dependable Vilter Refrigeration.

CHILL WITH PAKICE

Vilter PakIcers make crystalform ice as you need it—right on the job. PakIcer, pumped to the mixer in proper quantities melts quickly, chills mix fast, really *shortens* mix time.

CHILL WITH COLD WATER

Vilter Supercapacity Water Coolers quickly supply you with great quantities of cold water for mixing or aggregate chilling by inundation.

CHILL WITH COLD AIR

Vilter Air Units deliver low air temperatures for aggregate cooling with cold air. Adequately designed for large air volumes, you'll be able to meet requirements everyday.

Let a nearby Vilter representative show you how many ways you can save with Vilter Refrigeration.

Vilter

REFRIGERATION and AIR CONDITIONING

THE VILTER MANUFACTURING COMPANY

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Ammonia and Freon Compressors • PakIcers
Evaporative and Shell & Tube Condensers
Pipe Coils • Valves and Fittings

Runway, Access Road Are Built at Airport

Slag-Macadam Base Is Topped With Hot Plant-Mix Followed
By Bituminous Seal Coat at Beaver County Airport, Pa.

♦ A 100-ACRE field in western Pennsylvania, formerly sharply rolling farm country, has been made over into an airport which ultimately will be expanded into the Class 2 group. This construction at the Beaver County Airport was undertaken by the Board of Beaver County Commissioners with Federal Aid from the Civil Aeronautics Administration, and with state aid from the Pennsylvania Aeronautics Commission. The site in Chippewa Township is off State Route 51, 3¾ miles from Beaver Falls by airline and 5 miles by highway. Its elevation is 1,247.4 above sea level.

Construction got under way in December, 1947, with a preliminary grading and drainage contract of \$92,321.90 that was awarded to the Harrison Construction Co. of Pittsburgh, Pa. Under this phase two runways were graded and turfed, and adequate drainage facilities installed. A north-south runway 2,300 feet long intersects at right angles an east-west runway 2,450 feet long; both are 300 feet wide. Approximately 130,000 cubic yards of excavation, mostly shale, was involved in this first contract, which was followed by contract 2, for \$10,000, which was given to Arthur Snyder of Pittsburgh, Pa., for additional turfing work.

In February, 1950, a \$170,000 contract was awarded to Nardulli & Sons, Inc., of Etna, Pa., for further grading and the initial paving at the airport. The east-west runway, which has a 30 to 1 glide angle coming in to its eastern end, has been extended to 4,000 feet by grading at both ends. Of this length a strip 2,000 feet long x 50 feet, to the side of the center line, has been paved. Eventually widening on one side only will bring it to a 100-foot width. The contract also includes the construction of an access road, 1,500 feet long x 20 feet wide, leading in to the site from State Route 51.

Grading Operations

The access road terminates at a new plane parking apron, also part of contract 3, which is 175 feet long x 100 feet wide. From the apron a taxiway 30 feet wide x 700 feet long connects to the intersection of the two runways. A future administration office and hangars will be erected at the apron.

Grading involved 255,000 yards of excavation including such varied materials as sand, silt, clay, gravel, and shale. The runway section has a 300-foot full width and is graded to a 1 per cent slope from the center line to the edge of pavement, and to a 1.5 per cent slope from the pavement out over the shoulders. Cuts averaged 25 to 30 feet in depth, while the greatest fill is 40 feet high. Embankments were built up in 8-inch lifts, and compacted by rolling to not less than 90 per cent of maximum density at optimum moisture as determined by Proctor density tests.

Because of late-winter and early-spring rains, grading did not get started until April. Throughout the dirt-moving operations, the soil was sufficiently wet to render unnecessary any watering of the fills by tank truck. No shovels were used, as the bulk of the dirt was moved by scrapers, either self-propelled or tractor-drawn. To facilitate the loading, the hard shale was first loosened with a LeTourneau Rooter.

Long and Short Hauls

For the long hauls, 2,500 feet up to a

mile in length, the dirt was moved by rubber-tired self-propelled scrapers which included four Super C Tournapulls and four LaPlant-Choate motor scrapers that averaged 17 yards a load. For the short hauls, under 1,000 feet, the dirt was moved by tractor-scraper

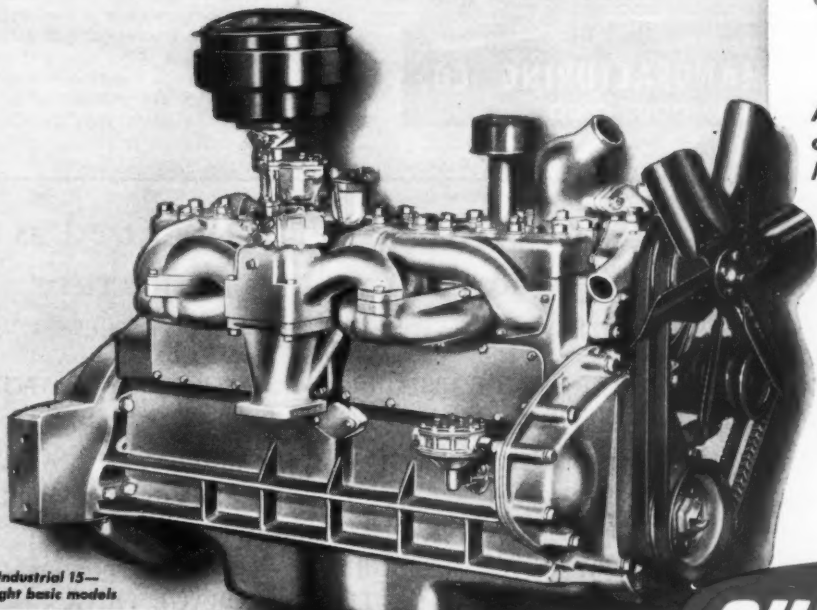


C. & E. M. Photo
On the Nardulli contract at Beaver County Airport, Pa., an Allis-Chalmers HD-19 pusher helps load a LaPlant-Choate scraper with 17 yards.

units. This fleet included 4 Gar Wood 25-yard scrapers pulled by Allis-Chalmers HD-19 tractors; 3 LeTourneau 15-

(Continued on next page)

BIGGEST POINTS TO REMEMBER WHEN YOU BUY INDUSTRIAL ENGINES !



Chrysler Industrial 15—
one of eight basic models

High Speed Operation Means
BETTER PERFORMANCE
Chrysler has it!

Mechanical Excellence Means
LOWER MAINTENANCE COST
Chrysler has it!

Large Mass Production Means
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Nation-wide Service Means
LESS DOWN TIME
Chrysler has it!

A few of the many
outstanding Chrysler
Mechanical Features

- All friction surfaces Superfinished by an exclusive Chrysler process
- Statically and dynamically balanced Crankshaft.
- Sodium cooled Exhaust Valves.
- Stellite Exhaust Valve Seat Inset.
- Stainless Steel Valve Springs.
- Chrome top Piston Ring.
- Completely waterproofed Ignition
- By-pass thermostat Cooling System

Among engineers who have seen the difference in the field there is no question about the superior performance and economy of high speed industrial power. Only remaining question is—"Who makes the high speed industrial engine most free from maintenance and most readily adaptable to our equipment at the lowest cost?"

The answer is leading more and more manufacturers to Chrysler, first to develop a higher speed engine, continuously first with the greatest number of important improvements. A letter of inquiry will bring a qualified engineer to your desk for discussion.

Industrial Engine Division, Chrysler Corporation, Detroit 31, Michigan.



MORSEPOWER WITH A PEDIGREE

Runway, Access Road Are Built at Airport

(Continued from preceding page)

yard Carryalls teamed with Caterpillar D8's; and 2 Bucyrus-Erie 12-yard scrapers in tow of International TD-18 tractors.

Other tractors on the job, besides those mentioned as working with the scrapers, included two HD-19's, two D8's, and two TD-18's. They served as pushers to help load the dirt-moving units, pulled the Rooter in the shale cuts, dozed and shaped the fills, or towed the two sets of LeTourneau dual-drum sheepfoot rollers used in compacting the fills. A Huber 10-ton 3-wheel roller also helped in compacting the 8-inch lifts. The final shaping was done by a Caterpillar No. 12 motor grader. With this equipment the contractor averaged from 7,000 to 8,000 yards of excavation in an 8-hour day. A line of 6-inch perforated-tile un-



C. & E. M. Photo
Airport fills are compacted by a LeTourneau sheepfoot roller, pulled by an HD-19, and a Huber 10-ton 3-wheel roller.

derdrain parallels the runway, with 6-inch tile outlets connecting to the storm-sewer system. Ditches for the small-size pipe were opened by a Barber-Greene trencher, while the cuts for the large pipe were made by a Lima 101

¾-yard backhoe. An International TD-12 with crane attachment helped in setting the pipe. Backfill was consolidated by Ingersoll-Rand tampers powered by a Gardner-Denver 210-cfm air compressor. Equipment was fueled at the airport with Amoco diesel fuel or gasoline stored in two 1,000-gallon tanks.

Paving

Base and paving items in the contract were sublet to Interstate Amiesite Co., Monaca, Pa., which has an asphalt plant at its headquarters, less than 10 miles from the airport. This work got under way in the middle of August, and was completed by November. The base for the runway, taxiway, and apron is a slag-macadam course which is 10 inches thick over the apron and the final 300 feet at the ends of the runway, and 8 inches thick for the remainder of the runway and all of the taxiway. The taxiway base is 31 feet wide for the 30-foot pavement. The base for the runway was laid to a width of 50 feet 6 inches.

Slag for the base came from the Midland Slag Co. at Midland, Pa., on the Ohio River about 18 miles from the job site. It was delivered to the airport in trucks, and was laid in loose 10 and 12-inch courses by a self-propelled Jaeger aggregate spreader and compacted in one course by a Vibro-Tamper to 8 and 10 inches. The base was choked with slag fines, then vibrated again by the Vibro-Tamper, broomed, and rolled. The top course was primed with asphalt applied at the rate of 0.25 gallon to the square yard. After that a 2-inch layer of bituminous concrete was laid weighing about 170 pounds to the square yard; the plant-mix contained about

8.5 per cent bitumen by weight.

The hot top paving was then given a seal coat consisting of a shot of asphalt applied at the rate of 0.22 gallon to the square yard, and covered with 12 pounds to the square yard of crushed-stone chips. The chips were light-colored so that the runway paving would be clearly defined from the air.

Quantities and Personnel

The major items in the grading and paving airport contract included the following:

Excavation	255,000 cu. yds.
Bituminous-concrete paving	20,000 sq. yds.
Slag for base course	4,292 cu. yds.
Bitumen, prime coat	4,625 gals.
Bitumen, seal coat	4,069 gals.
Aggregate, seal coat	110 tons
Tile, 6-inch	3,300 lin. ft.
Turfing	32 acres


An average work force of 25 to 30 men was employed on the project by Nardulli & Sons, Inc., under the direction of Alphonse "Dick" Nardulli, Superintendent.

Engineering and supervision of construction
(Concluded on next page)

FRACO

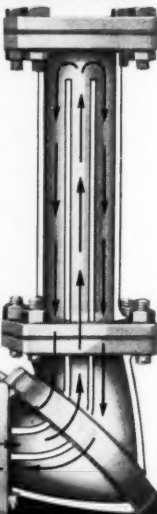
REDI-HOT SPRAY BAR

FITS ANY DISTRIBUTOR



CIRCULATES LIKE THE HUMAN HEART

Hot bituminous material delivered through the inside bar first is sent out each end on the same principle as the human heart pumps blood out and back again, reaching every part. It is circulated throughout the Fraco Spray Bar from end to end, into every nozzle and back through the heating unit before the bar is opened for operation. This circulation is just as effective whether the bar is folded or straight. It assures the hot material getting to every point, cleaning all sludge, assuring even viscosity for immediate delivery when opened. This assures a straight start.



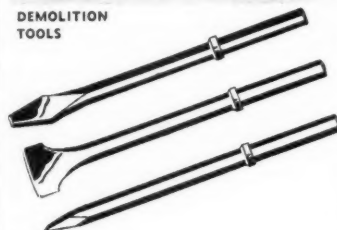
WRITE FOR DETAILS — DEPT. A

FRACO MANUFACTURING CO.

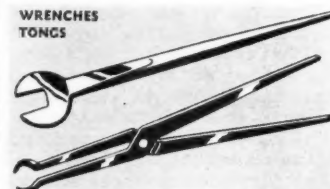
RICHWOOD, OHIO

STRUCTO LINE OF CONTRACTORS TOOLS

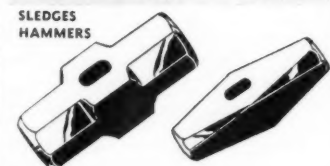
DEMOLITION TOOLS



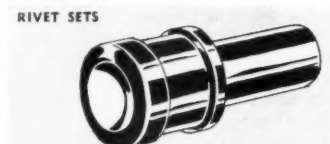
WRENCHES TONGS



SLDGES HAMMERS



RIVET SETS



DRIFT PINS



AIR HAMMER TOOLS



ALL STRUCTO tools are made in the Arrow shops by skilled tool makers.

Only the finest quality steel is used, and every STRUCTO tool is backed by 36 years experience in making fine tools.

Write for Bulletin No. 75 showing the complete line.

ARROW TOOLS INC.

1900 South Kostner Ave., Chicago 23, Ill.

CUMMER

PORTABLE PLANTS from 50 tons to 70 tons per hour.

A name long recognized as a leader in the manufacture of fine asphalt plants

SEMI-PORTABLE and STATIONARY PLANTS from 60 tons to 100 tons per hour.

A CHECK LIST OF CUMMER EQUIPMENT and ACCESSORIES

- ✓ DRYERS—25 to 100 tons per hour, diesel or electric power.
- ✓ COLD STORAGE BINS—25 tons to 100 tons. 1, 2, 3, or 4 compartments.
- ✓ PIPING and FITTINGS—steam jacketed asphalt.
- ✓ TIME LOCKS—automatic for mixing cycles.
- ✓ VALVES—steam jacketed two or three way.
- ✓ PROPORTIONING FEEDER—5 to 100 tons per hour. 1, 2, 3, or 4 compartments.
- ✓ BUCKETS—steam jacketed asphalt.
- ✓ MIXERS—400 lbs. to 8000 lb. capacity.

- ✓ ELEVATORS AND CONVEYORS.
- ✓ PUMPS—asphalt and fuel oil.
- ✓ BURNERS—high or low pressure.
- ✓ FUEL OIL STORAGE TANKS.
- ✓ ASPHALT STORAGE TANKS.
- ✓ TOWER UNITS—complete.
- ✓ ASPHALT SMOOTHERS, TAMPERS, RAKES AND FIRE WAGONS.

All other accessories such as Oil and Gas Burners; Dial and Beam Scales, etc.

THE F. D. CUMMER & SON COMPANY

Builder of fine asphalt plants
Cleveland 15, Ohio

USA

struction was handled by Michael Baker, Jr., Inc., Consulting Engineers of Rochester, Pa., which was represented at the airport by Robert T. Javens, Resident Engineer.

The Board of County Commissioners of Beaver County, Pa., is headed by Joseph S. Edwards, President.

For the Department of Commerce, Civil Aeronautics Administration, A. H. Wessel is District Airport Engineer for Pennsylvania with headquarters at the Harrisburg State Airport, New Cumberland, Pa. For the Pennsylvania Aeronautics Commission, William L. Anderson is Executive Director and David O. Johnson is Chief Engineer. This is an agency of the Pennsylvania Department of Commerce, with Theodore Roosevelt III, Secretary.

Depth-Measuring Gages

A line of staff gages is manufactured by Leupold & Stevens Instruments, Inc., P. O. Box 5082, Portland 13, Ore. These gages, available in a variety of lengths and widths, permit measurement of water or any other liquid level for irrigation, in streams, wells, etc. They are made of porcelain-enamelled iron so that they will not affect the flow of the liquid. The porcelain enamel enables easier reading and prevents rusting and discoloration. The gages may be obtained with graduations in either the English or the metric systems.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 390.

New Trucks Announced

The new Ford trucks for 1951, including more than 180 models, have been announced by Ford Motor Co., Dearborn, Mich. They feature automatic Power Pilot carburetion-ignition control on all engines. The cab and front end have been restyled to give a more rugged appearance, and the rear window enlarged to more than 3½ feet for full vision.

Weather sealing on doors is improved, and the floor-pan area is sealed against weather and fumes. Cast spoke wheels with demountable rims to provide interchangeability with trailer wheels are now standard on F-7 and F-8 heavy-duty models, but steel disk wheels continue to be available. All engines now have chrome-top piston rings, autothermic expansion-control pistons, and new high-lift camshafts. Offset piston pins are used on 95-hp 6-cylinder and 100-hp V8 engines to insure quiet operation. On F-7 and F-8 trucks, coolant distribution is improved by a larger radiator tank and water bypass tubes on the engine.

A new 5-Star Extra cab is optional on the 1951 Ford trucks. It is sound-proofed with undercoating on the floor, spray-on material on the doors and back panel, and roof insulation. The insulation consists of a 1½-inch-thick glass-wool pad cemented to the under-



The Ford Series F-8 "Big Job" for 1951 is built to handle tough jobs in trucking, and at the same time is constructed for driver comfort, safety, and low-cost performance.

side of the roof panel and covered with a perforated acoustic board as protection against heat and sound. The full-width seat has a thick foam-rubber pad on the cushion. The interior of the cab includes full-length passenger-car-type door trim with arm rests on both doors. There are two sun visors, a cigar lighter, a glove-compartment lock, a dome lamp with automatic door switches, right and left-hand door-locking cylinders, and twin matched horns.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 293.

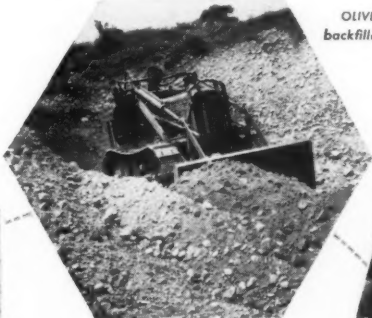
Handles Eastern Roller Sales

Eastern District Sales Representative for The Buffalo-Springfield Roller Co. is Harold C. Clark. From headquarters in Harrisburg, Pa., he is working with the company's distributors in 18 eastern states and with highway-department officials and Federal government officials. He was formerly General Sales Manager for Roscoe Mfg. Co.

OLIVER HG Crawler Tractor with Ware Loader loading sand into truck.



OLIVER HG Crawler Tractor with Ware backfiller blade attached to shovel arms.



OLIVER Model "88" Wheel Tractor with Ware Boom handling cast iron pipe.

...take the "Load" out of Your Loading Problems!

Whatever your loading problem, the easy, economical answer is an Oliver Crawler Tractor or Oliver Industrial Wheel Tractor and Ware Front-End Loader.

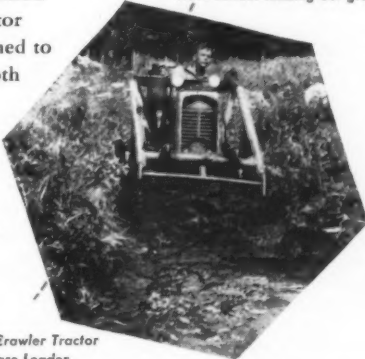
These powerful tractors and the hydraulically operated loaders are easy to operate . . . easy on maintenance and operating costs. Lift and bucket are hydraulically controlled. Hydraulic control of bucket assures greater breaking-out action and full loads . . . prevents wasteful spillage.

"Midsection" pivot allows longer reach of dumping position and distributes the weight advantageously over the tractor frame to minimize strain. The hydraulic rams are designed to take most of the shock loads, assuring longer life for both tractor and loader.

And, the tractor-loader unit can be quickly converted to backfiller, boom or lifting fork. Special buckets are available for coal, snow or humus loading. The hydraulic system can be used to power other equipment such as mowers, sweepers, etc., in combination with the loader. For all the facts, see your local Oliver Industrial Distributor, or write direct to:



OLIVER Model "88" Wheel Tractor and Ware loader loading out gravel.



OLIVER HG Crawler Tractor with Ware Loader on ditching job.

THE OLIVER CORPORATION

Industrial Division: 19300 Euclid Avenue, Cleveland 17, Ohio
A complete line of Industrial Wheel and Crawler Tractors



"THE SIGN OF EXTRA SERVICE"

SASGEN

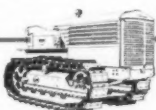
New Electric-Powered CHAMPION DERRICK



Boom only can be supplied for use with existing Mast and bottom
Single line cap. 300 ± @ 100 feet per minute
Double line cap. 600 ± @ 50 feet per minute

The most complete line of contractors' derricks, hoists, and winches. Write for catalog.

The Sasgen line is handled by leading equipment distributors everywhere.
SASGEN DERRICK COMPANY
3131 W. Grand Avenue, Chicago 22, Ill.





Using the new Guide-A-Cut measuring guide, masonry-saw operators can make angle cuts of 45 and 90 degrees easily, says Clipper Mfg. Co.

For Easy Angle Cut On Masonry Material

The new Guide-A-Cut adjustable measuring guide, adaptable to the conveyor cart of any Clipper masonry saw, enables angle cuts of 45 and 90 degrees to be made with ease, according to Clipper Mfg. Co., 2803 Warwick, Kansas City, Mo. It eliminates the need for tacking material guide strips on the conveyor cart, or the use of a special cart; it is simple to adjust; it holds the material firmly to eliminate slipping; and it reduces blade breakage, Clipper says.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 388.

Slide Rule Speeds Concrete-Beam Design

A new pocket-sized plastic slide rule, 7 x 2 1/4 inches, offers an accurate and time-saving method of designing reinforced-concrete beams and slabs, according to a recent statement by Seymour Lester, C. E., 7906 Santa Monica Blvd., Hollywood 46, Calif.

By setting the graduated slide on the known quantities, such as moment and shear, the required beam size, steel area, stirrups, unit shear, bond, k value, etc., are indicated for complete beam design. This slide rule is said to eliminate practically all need for formulas, tables, charts, or multiplying slide rule. It is applicable for all values of design stresses and assures a solution without error, according to the designer.

Further information may be secured from Mr. Lester. Or use the Request Card at page 16. Circle No. 397.

Aluminum Structural Design

Information on how to design load-carrying structures in aluminum is presented in complete and up-to-date form in the 1950 edition of the handbook "Aluminum Structural Design," recently issued by Reynolds Metals Co., 2500 S. Third St., Louisville, Ky.

This book, says Reynolds, enables any engineer familiar with the mechanics of materials to design an original structure of aluminum, or to convert an existing structural design from some other material to aluminum. The discussion is broken down into chapters on figuring tensile stresses, compressive stresses, bending stresses, and shear stresses, as well as stresses in cylinders subjected to fluid pressure. Formulas and actual examples contribute to the usefulness of the book. A section is devoted to fabricating considerations and joining methods, including riveting, bolting, fusion welding, and spot welding. Additional chapters cover deflection and vibration problems.

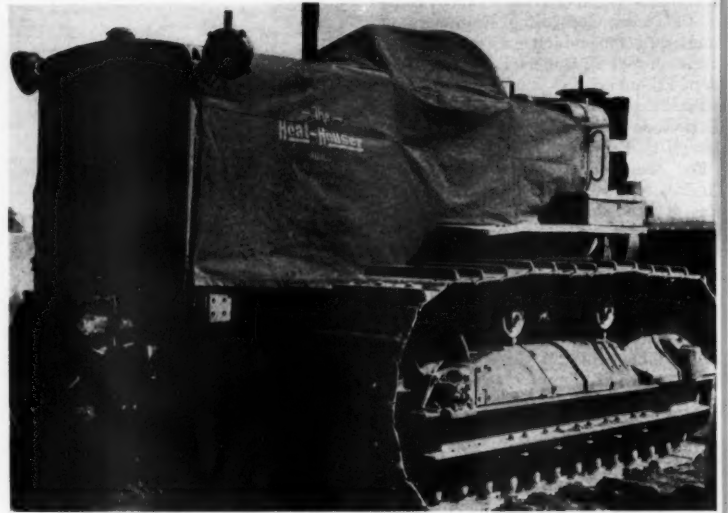
The tabular matter is exceptionally complete—66 pages of tables presenting information on physical, chemical, and mechanical properties; a list of sizes, alloys, and tempers of available aluminum mill products; shear, moment, and deflection formulas for beams; column formulas; elements of sections for both single shapes and combinations of

shapes; minimum bend radii for sheet and plate; and comprehensive rivet data. In addition, there are tables of data on other structural materials and on related general information such as decimal equivalents.

The 6 x 9-inch book contains 130 pages, 144 illustrations, 39 tables, and 3 indexes, including an itemized cross index. It will be sent without charge to designers, engineers, architects, and other company officials who request it on their company letterhead, addressing Reynolds Metals Co., 2500 S. Third St., Louisville 1, Ky.

Caterpillar Shifts McCoy

William E. McCoy of Camden, N. J., has been appointed Assistant Sales Manager of the Central Division of Caterpillar Tractor Co., Peoria, Ill. He was formerly a district representative in the Eastern Division. In his new position he succeeds Herman Eberling who went on active duty as a captain in the U. S. Corps of Engineers.



Heat-Houser, a one-piece heavy-duty waterproof canvas housing, is now made for track-type as well as wheel tractors. For further data write to The Fort Dodge Tent & Awning Co., Fort Dodge, Iowa. Or use Request Card at page 16. Circle No. 258.



Koehring 34-E twinbatch Paver

can hit a top output of 86.7 batches an hour, on 60-second mixing time. This reserve production capacity can be used to pick up lost time from normal production delays . . . assures 50 batches an hour, 8 hours a day, at no increase in batching, hauling and finishing equipment. Limited-production, single drum paver theoretically mixes up to 50 batches an hour, but usually averages only about 45 batches. Under identical job conditions, and with same auxiliary equipment, Koehring 34-E *twinbatch* gains 5 extra batches an hour . . . 40 extra batches daily. Yet, it requires only approximately 3 extra batches a day to offset the slight additional cost of the 34-E *twinbatch*

Paver. That leaves a net gain of 37 extra batches daily to help maintain schedules, handle more jobs per season, and earn more profits per job. There's no extra paver operating expense, service or maintenance, because the 34-E *twinbatch* is as simple as a single drum machine. Basic units are the same, except for double compartment drum . . . and, with split-second Autocycle control, every mixing operation is automatic, accurate and fast.

See for yourself why you will be miles ahead on your highway, airport and other big production paving contracts with a Koehring 34-E *twinbatch* Paver. Get complete information from your Koehring distributor, or write for new 18-page catalog.

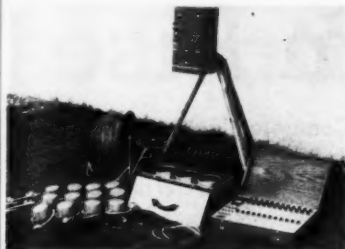
KOEHRING COMPANY, Milwaukee 16, Wis.



KOEHRING *twinbatch*® PAVERS

SUBSIDIARY COMPANIES: PARSONS • KWIK-MIX • JOHNSON

CR106



Midwestern Geophysical's new portable seismographic unit will provide, on site, data concerning location of bedrock, soil characteristics, and strata locations of surface materials.

Seismographic Unit Used for Soil Survey

A new and complete portable seismographic unit for use by engineers, contractors, and highway departments in determining soil conditions of proposed construction sites has been developed by Midwestern Geophysical Laboratory, 2803 W. 40th St., Tulsa, Okla. It has

wide application, the company says, in determining the suitability of dam, bridge-pier, and building sites; the location of new highways; the depth and extent of sand and gravel deposits; and in solving many construction and engineering problems. Its principal features are its accuracy, portability, and sturdy construction.

The seismographic unit consists of a recording oscillograph, amplifier and test balance unit, cable and reel, daylight developing unit, and 12 geophones. Each unit is compact and portable, the heaviest piece weighing 30 pounds. The seismograph will provide, on site, data concerning the location of bedrock, general and sometimes specific data concerning soil characteristics, and strata locations of the various surface materials.

Bulletin Port-S 10-50-B, containing a complete description of the instruments, principle of operation, and varied applications, may be obtained from the company. Or use the Request Card at page 16. Circle No. 363.



This prefabricated building for contractors comes complete in portable sections. The building is available in 14, 16, 18, and 20-foot widths; middle extensions can be added to make it into any length. Wright Co. is the manufacturer.

Contractor "Shack", Prefabricated Unit

A full line of prefabricated sectional buildings for use as construction shacks, field offices, temporary shops or storage sheds is manufactured by the Wright Co., 9317 Cottage Grove Ave., Chicago 19, Ill. The units are made of tongue-and-groove kiln-dried fir lumber and come complete in portable sections with floor, side walls, roof, double or single doors, windows, ventilators, skids, and a coat of paint.

The prefabricated buildings are available in 14, 16, 18, and 20-foot widths. The base sizes are such that middle extensions can be added to make them of any length. They are easily assembled with bolts and steel clamps, and require very little nailing, the company points out; they are therefore convenient for quick moves.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 253.

DUAL-PURPOSE Johnson Elevating Charger

As batch plant, Johnson Elevating Charger has a size 14, 1000-lb. cement weigh batcher, hung under a 33-bbl. overhead storage hopper . . . or, to charge dual-batch trucks, two 1000-lb. weigh batchers can be used. It's quickly changed to transfer plant by removing batchers and cone, and bolting a 50-bbl. extension section to upper hopper. Easily moved and erected by dump truck, no crane needed. See your Johnson distributor.

C. S. JOHNSON
Champaign, Illinois



MULTIPLE-SPEED Parsons 250 Trenchliner

With 30 digging feeds, 3 bucket line and conveyor belt speeds all fully reversible, plus 3 travel speeds, this Parsons 250 Trenchliner is extremely flexible . . . digs 16 to 42" wide, up to 12'-6" deep . . . cuts within 11" of either side. Power-shift, arc-type conveyor dumps right or left. Get complete facts on this general-purpose 250 Trenchliner, or 4 other heavy-duty sizes, from your Parsons distributor, or write us today.

PARSONS
Newton, Iowa



7-SECOND DISCHARGE with Kwik-Mix 11-S

Saving important seconds on every batch of concrete, tilted Flow-Line Discharge Chute pours full 12.1 cu. ft. batch in 7 seconds. Kwik-Mix 11-S also has exclusive Dandie® blade-and-bucket drum that double-mixes every batch at no increase in mixing time. It's available with side or end discharge, 2 or 4 wheels, and special tower for loading trucks. Other sizes: 3½-S to 16-S. Your Kwik-Mix distributor has complete facts.

KWIK-MIX
Port Washington, Wisconsin



Roomy, flow-line skip is 120" wide for charging with dual-tired batch trucks . . . big throat discharges almost full batch during 8-second skip hoist. Special A-frame elevates boom 30', discharges bucket 15½' high.



Koehring rubber-tired 16-E twinbatch has 60' elevated boom, discharges controlled batch at 21' height (higher with special boom). Mixes, distributes up to 50 cu. yds. per hour. Travels job to job at 6 m.p.h.



For "timely", precision-finishing with plenty of reserve speed, Koehring Longitudinal Finisher operates at almost twice the speed of a modern 34-E paver . . . produces mechanically-accurate slabs 8 to 30' wide, uniform crown transitions, 1-man operation.

Arc-Welding Lessons

"Modern Arc-Welding Lessons AC & DC", a 192-page textbook prepared by Hobart Trade School, Inc., Troy, Ohio, comprises the second part of the new five-part Hobart handbook "Electric Arc Welding—Procedure and Practice" and contains the complete series of 40 arc-welding lessons offered at the Hobart Trade School. Chapter headings include: Preliminary Instructions; Starting and Manipulating the Arc; Welding Common Joints With Bare Electrodes; Welding Light-Gage Sheets With Coated Electrodes; General Welding With Coated Electrodes in the Flat, Horizontal, Vertical, and Overhead Positions; Pipe Welding; Welding Cast Iron; and Special Practices and Tests.

The text material, following the introduction and preliminary instructions, is divided into welding exercises of gradually increasing difficulty. The student is taken through the various problems involved in practical arc welding as rapidly as he can master the principles involved. The book is written in easy-to-understand words, giving all the fundamentals of arc welding, with descriptive pictures, charts, and diagrams. Bound in a flexible cover, the text sells for \$1.00 per copy—with special prices to schools.

Chem-Therm to Build

The Chem-Therm Mfg. Co., Pasadena, Calif., manufacturer of steam cleaners, steam heaters, wash rack equipment, and steam-cleaning compounds, has completed plans for a \$100,000 factory in Monrovia, Calif. Milton W. Melzian of Pasadena designed the plant and A. W. Brokate of Arcadia is building it.

Hungry Horse Dam Rises In



A Bucyrus-Monaghan walking dragline scoops raw rock, aggregate for Hungry Horse concrete, from the Flathead River.

Concrete Placing Shifts to High Speed as Contractors Crowd Schedule on World's Third-Highest Dam

By **RAYMOND P. DAY**,
Western Editor

★ AT 4:10 p.m. on the afternoon of September 7, 1949, 500 men scattered over the site turned their eyes skyward. Slowly, ponderously, the big 8-yard bucket lowered to the dull-colored limestone. Two men grabbed trailing ropes and released the safety latches. A signalman with a telephone transmitter at his lips barked an order.

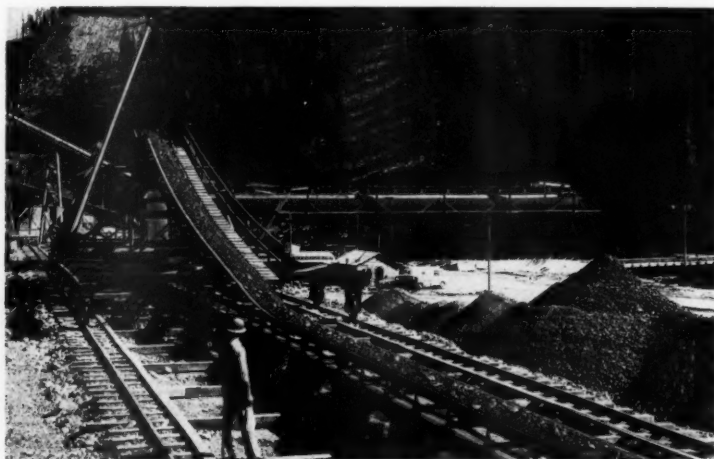
The two bottom gates dropped away from the load, and with a rasping screech, 8 cubic yards of concrete dropped in an inert mass on the South Fork of the Flathead floor near Coram, Mont. The first bucket of concrete had finally been placed in Hungry Horse Dam, ending months and years of preparation.

(Continued on next page)

U.S. Bureau of Reclamation Photos



The rock goes into a transfer bin from which "Encs" haul it to the crusher.



Raw aggregate on a conveyor line passes to the plant to be sized and crushed.



The batch plant is high on the gorge walls near the top of the dam. Cement and pozzolan for the concrete come in by semitrailers; water is tapped from Fawn Creek.

es In Flathead Canyon

High crowd third-

pon ofattered s sky- ne big ill-col-rabbed safety ephone order. away rasping concrete South Coram. ete had Horse ars of

Only enough concrete was placed in 1949 to work out any "bugs" in the complex production and batching facilities, and there were very few; 1950 was the first big concrete year for the joint-venture contractors who call themselves General - Shea - Morrison. The firm expected to place 1,000,000 cubic yards of concrete last year—a third of the total—under its \$43,431,000 contract. Hungry Horse, the world's third-highest and fourth-largest dam, is a U. S. Bureau of Reclamation power project, with incidental value for flood control and recreation.

Dam Rising Rapidly

The site is vastly different from that day in 1946 when **CONTRACTORS AND ENGINEERS MONTHLY** first covered the Hungry Horse story. Instead of the rude bulldozed trail of that day, broad access highways now lead to the dam. The stripping is finished, and the reservoir upriver from the dam is now largely cleared. The contractor's permanent construction plant is operating at capacity for the first time.

Hungry Horse is known in construction and engineering circles as one of the most intelligent, practical compromises ever to come out of a given set of natural conditions. The contractor has made the most from conditions that were none too favorable. For example, it was a superhuman task to erect a batch plant and railroad track high on the gorge walls near the top of the dam, but it was done nonetheless, and now the cableway operators can make wonderful time lowering the concrete instead of raising it.

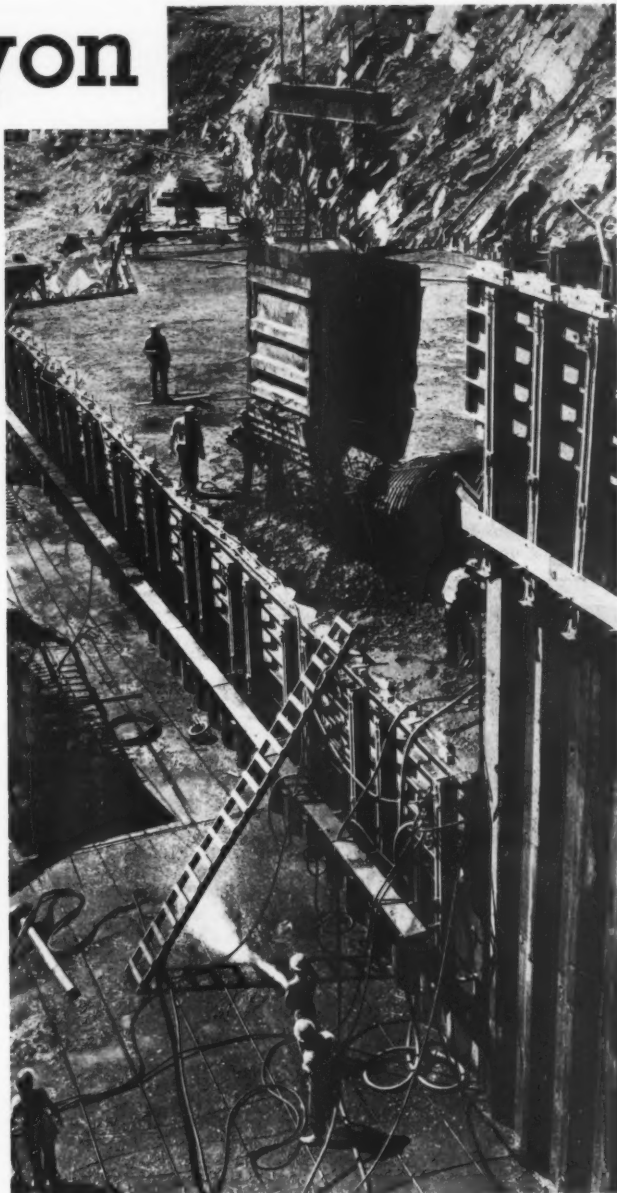
If for no other reason than the fact that the Bureau of Reclamation chose in 1950 to build a dam with God-given aggregates instead of man-made crushed ones now so much in vogue, it should help to restore the feeling that the USBR is a top-notch when it comes to knowledge of concrete.

The dam when completed will be 564 feet high. Its 2,115-foot crest will curve

(Continued on next page)



Concrete travels the cableway in 8-yard Crowe buckets, silhouetted against the Montana sky.



Here is concrete placing and blasting by air-water jets. General-Shea-Morrison is using Blaw-Knox cantilevered steel forms for the dam proper.



Hungry Horse will be the world's third-highest and fourth-largest dam. Last year was the first big concrete year; there are still about 2,000,000 cubic yards to go.

Hungry Horse Rises In Flathead Canyon

(Continued from preceding page)

on a 1,200-foot radius. Back in 1946 the designers halfway believed Hungry Horse would be a straight gravity-type structure, but when bedrock conditions turned out to be better than they thought, they changed to a gravity-type arch dam. It will do the same work with less concrete.

They are saving on cement by using pozzolan, too. They are handling structural cooling with 3,600,000 pounds of tubing, buried in the mass as was done at Boulder. Water at 35 to 50 degrees F will be pumped through the tubes to help dissipate cooling heat. Cold water is available in nearby Fawn Creek, and for that matter in the river itself.

Aggregate Production

For countless ages, geological decomposition of the Rocky Mountains has been going on. At Hungry Horse, the

river picked up particles of Siyeh limestone, predominantly sandstones, argillites, dolomites, and quartzites, and gradually wore them round. Great deposits of aggregates, enough to build a dam with only 10 per cent less concrete than Hoover, were there. The stream in its infinite wisdom had done a fair rule-of-thumb job of sizing these materials.

The USBR chose an aggregate source upstream from the dam. It didn't look good to the contractors, because a portion of this deposit would be flooded by the reservoir before the end of the construction period. Moreover, the Bureau plans to store 1,000,000 acre-feet from the 1952 spring runoff. That would have meant stockpiling a tremendous quantity of aggregates, which had to come from the storage area.

The contractors came up then with the scheme of aggregate production from a deposit 5 miles below the dam, where the South Fork flows into the main Flathead River. The scheme was acceptable to the USBR. The contractors purchased 110 acres, with a production potential of about 4,000,000 cubic yards.

The raw gravel is removed from the property by a 10-yard Bucyrus-Monaghan walking dragline, which often digs 65 feet deep below the water line. The machine dumps to a transfer hopper where a fleet of twenty 20-yard Euclids are loaded. These units then transport the material 4½ miles over a good 40-foot waterbound-gravel highway to the processing plant.

As the "Euclids" dump to the primary feeder at the plant, boulders larger than 6 inches pass through either of two 20 x 36 Cedarapids jaw crushers, set at about 4 inches of clearance. The few large stones are quickly broken down to a smaller size, and the pieces return to the 30-inch conveyor. This conveyor then transmits its material to a stacker line, which deposits the gravel in a raw storage pile 800 feet long, tapped underneath by a recovery tunnel. There are 400,000 cubic yards of dead storage and 150,000 cubic yards of live storage, in case of a major breakdown on the supply line.

Four Jeffrey vibrating feeders tap the raw storage pile through the roof of the 800-foot timber recovery tunnel. The feeders admit pit-run material to a long 30-inch delivery conveyor which takes the material to the top of the aggregate-processing building: the heart of the outfit.

The reduction of materials to size is basically a screening process, although about 15 per cent of the pea gravel passes through a secondary crushing process. Varying amounts of blending sand are also added.

Sizing of four sizes of aggregate is made by Ty-Rock vibrating screens, and it is interesting to note that over 1,200,000 tons of material passed over these screens without a single bearing failure. The four aggregate sizes made by these screens are 6 to 3-inch; 3 to 1½-inch; 1½ to ¾-inch; and ¾-inch to No. 4, or pea gravel.

As the material passes over the screens, it is washed by pressure water jets, and the four sizes of aggregate are then conveyed to storage in piles outside the plant.

Natural sand, of course, falls through the screens, and passes to a Dorr Hydroseparator. When the sand in the pit-run is short, as it tends to be, a small amount of pea gravel is pulled and fed to a Marcy rod mill. Huge 300-pound steel rods in the rod mill grind the hard rock, and the loss of steel averages about ¾ pound per ton of sand.

Fines from the sand-crushing equipment now come up a bucket elevator and dump into the Dorr Hydrosepara-

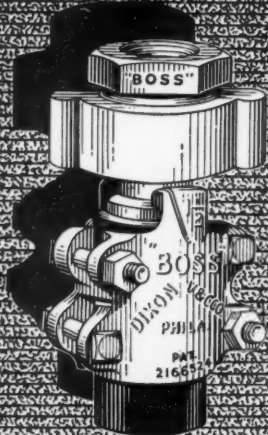
tor. The sand, after being sized, is carried to conveyors by Dorr classifiers. Three sizes of sand are produced and stored in separate piles. By blending the sizes carefully, the plant men can meet any fineness modulus the USBR sets. Ordinarily it stays consistently near 2.80. The following requirements govern the finished blend of sand:

Size Screen	Per Cent Retained
No. 4	0 to 5
No. 8	10 to 20
No. 16	10 to 20
No. 30	10 to 30
No. 50	15 to 35
No. 100	12 to 20
Pan	3 to 7

All conveyor belting was new when the aggregate production started. Much of the conveyor framework, head and tail sheaves, and so on had been used at Ross Dam in Washington. Generally speaking, the aggregate plant at Hungry Horse is one of the outstanding ones for control of sizes. The sand men have one big responsibility: to hold their fineness modulus constant without

(Continued on next page)

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THE "Quinn Standard" FOR CONCRETE PIPE

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appreciable tolerance. The pit-run material is weighed by a Merrick Weightometer, and recorded.

As the material is needed in the batches, it is sent by conveyor up to the batching bins of the mixing plant.

Proportioning Setup

The batching setup is unique because it had to be erected high on a gorge wall, after extensive excavation. It consists of a Johnson automatic 400-cubic-yard-an-hour plant, with Johnson cement and pozzolan silos. All control and recorder units are handled by one operator. Five Koehring 4-yard mixers, arranged in a circle on a platform in the plant, dump to a conical hopper over the loading tracks where "The Goose" operates.

The Goose is a diesel-driven Washington gondola, with two 9½-yard hoppers mounted to discharge at the bottom on one side of the car. The gates are operated by air rams. Three goose cars, loading and dumping to the cableway buckets, keep the concrete moving.

One of the most unusual design aspects of Hungry Horse Dam is the extensive use of pozzolan, or fly-ash, in lieu of cement. It is being used as an economy measure, and to increase the workability of a mix which uses 6-inch cobbles. The pozzolan is being shipped from the Chicago area, and General-Shea-Morrison is supplying the 130,000-ton requirement.

Pozzolan and cement are unloaded at a rail point in Coram, and trans-shipped by three 32-ton Olson semitrailers drawn by Euclid tractors. Since bad weather is a regular fall and winter feature at Hungry Horse, a weather-proof building 320 feet long was built to hold the cement and pozzolan. The building has unloading capacity for 8 railroad cars at one time. Beneath the railroad tracks are 14 cement bins and 6 pozzolan bins, with 30,000-barrel total capacity.

The hauling trailers discharge their loads in a hopper at the dam batch plant, from which point it is conveyed to storage silos.

As an indication of the extent to which fly-ash is used, these two main 4-yard mixes are used:

For 6-Inch Mass Concrete

Material	Pounds per Batch
6 to 3-inch	3,375
3 to 1½-inch	2,812
1½ to ¾-inch	2,812
¾ to No. 4	2,250
Sand	3,360
Cement	752
Pozzolan	360

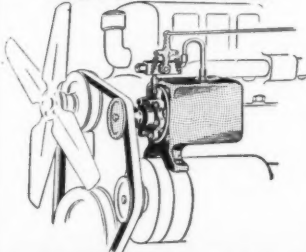
For 6-Inch Face Concrete

6 to 3-inch	2,757
3 to 1½-inch	2,757
1½ to ¾-inch	2,757
¾ to No. 4	2,757
Sand	3,111
Cement	1,128
Pozzolan	360

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Bureau of Reclamation Photo

Steel-reinforcement crew members at Hungry Horse.

Mixing water, normally a problem for a job this size, was an easy one to solve. A 7,500-foot wooden pipe, 16 inches in diameter, taps Fawn Creek about 600 feet above the batch plant. Water enters the plant through a 12-inch steel line, under a 600-foot head. The mixed concrete passes into the conical feeder, then to the hoppers on the Goose, and eventually to the cableway buckets and the pour.

Cableways Handle Buckets

At the time a gravity-type dam was conceived, there was some thought of pouring the concrete from a trestle. When the arch dam was designed, however, that scheme was ruled out because it would have taken two trestles at different levels to reach the entire area of curvature—as well as for other reasons.

Four cableways are in use. Three 25-ton cableways have a common head-tower 200 feet high, on the left abutment at elevation 3,590. The top of

(Concluded on next page)

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SCOOP Model C



The versatile Model "C" with exclusive planetary drive for dependable power has 6 "quick change" attachments. Saves bringing in "extra" equipment. Three-quarter cu. yd. scoop is standard equipment.

- Transports, elevates and pours concrete.
- Shovels, loads, transports dirt or bulk materials.
- Lifts and places forms and timbers.
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ATTACHMENTS INCLUDE: Swivel-type concrete hopper. Scoops in 5 sizes. Lift forks. Special fertilizer or hay fork. Crane boom. Track extensions up to 26 feet.

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This complete mobile concrete mixing and elevating plant eliminates costs of hauling and erecting expensive equipment. One man handles the entire operation—quickly "sets-up" ready for pouring... then controls every operation from dump truck to deck.

- Improved batch-timer and counter insures uniform mix.
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- Sturdy planetary drive hoist clutches.
- Mixes up to 50 yards per hour.
- Portable elevating and agitating storage plant for ready mix.



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Power-packed dozer at one end... scoop at the other. The Duo-Way is designed for top performance. Unit with 84-inch dozer blade, optional, at one end, and ¾-cu. yd. scoop at the other end performs four operations—loader, dozer, truck and tractor.

- Doses out, then scoops up dirt, lifts, transports and loads.
- Operator in sidesaddle seat has perfect vision and control.
- Rugged planetary drive for "extra" power.
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PORTLAND 20, OREGON



Hungry Horse Rises In Flathead Canyon

(Continued from preceding page)

this tower is anchored to the gorge wall by concrete in an anchor tunnel. Each tailtower for this assembly is 52 feet high, and operates on a common 800-foot circular track of 2,415-foot radius. The tailtowers are balanced from tipping by 500-ton concrete counterweights, poured into the structural frame.

The main cables are 3-inch lock-coil, 2,400 feet long. Hoist cables are all $\frac{7}{8}$ -inch, and the rigs are painted various colors to make things easier and safer for the signalmen.

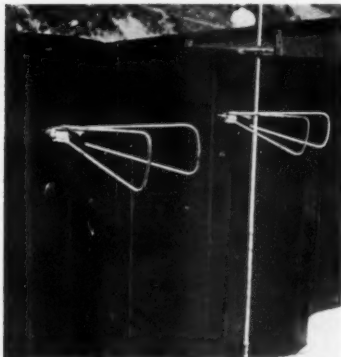
The hoists for two of these three towers are Lidgerwoods, the third is Washington Iron Works. All three are driven by 500-hp G-E motors at 425 volts. These are located in a house at the base of the headtower. Operators and controls are in a building across the canyon from the headtower. Two 75-hp Westinghouse motors use electricity at 440 volts to run the tailtower drive wheels. Speeds up to 150 fpm are possible.

The fourth cableway, which will handle concrete for the powerhouse, left abutment, and parkway, has the same hoisting equipment, with the exception that its engine is a Washington. It, however, is rated at 20 tons and will handle a 6 instead of an 8-yard bucket. Its headtower is a back-anchored 85-foot A-frame, on the right abutment back of the access road. Its main cable is a 3-inch 6 x 61 Hercules.

Forming and Placing

For the dam proper, approximately 20,000 square feet of Blaw-Knox 5-foot cantilevered steel forms are being used. They come in short panels which are connected and can be raised easily in large units by means of small A-frames and Coffing hoists, and are structurally strong and sound enough that they hold the concrete on line.

In the smaller walls and pours of the power plant, and also on some of the "square-up" pours which cover the abutment bedrock, wooden forms are used. These follow conventional design, and usually have wood shiplap facing nailed over 2 x 6 studs, with double 2 x 6 wales. Superior anchors and form ties are being used to anchor the forms.



Bureau of Reclamation Photo
Superior internal ties, poured in the concrete at Hungry Horse Dam, will hold the cantilever form legs on the next lift.

Air-water jets, and wet sandblasting, are being used on the cleanup of joints. As a rule the embedded cooling pipes are laid on the surface of a block just before the next pour. Vertical lines which carry air and water rise through the concrete at convenient locations, so it is easy for water and vibrator men to hook on to their power supply.

The 5-foot lifts are made in smaller sub-lifts, from 12 to 18 inches thick. Some of the monoliths are enormous, with as much as 2,550 cubic yards of concrete in one pour. The various courses of concrete are stepped up until the form is full at one side, tapering down in steps as the men keep dumping to prevent cold-jointing.

Eight-yard Crowe buckets, hanging from the cableways, are transporting the concrete from the Goose to the pour. When the buckets drop down to position, two men hang onto trailing ropes to release the safety latches so that the bucket may be dumped. The signalman then gives a telephonic order, and the cableway operator dumps the gates. There is a tremendous rebound as 8 yards of concrete screams out in a rush, and the buckets leap skyward about 20 feet.

Teams of vibrator men consolidate the concrete. All the vibrators are CP pneumatic machines, many of them the heavy 2-man type.

As the forms are stripped, the concrete surfaces are cured by running water. Vertical steps in the forms take care of construction joints, and no special pains are taken on these formed joints.

Concrete placing at Hungry Horse is not the year-round job many theorists thought. It is strictly a short-season affair. Last winter, desperate to move a few thousand yards of necessary excavation, the contractors had diesel-powered earth-moving machines running for five days and nights to keep them warm. It never moderated so they could work. After five days and nights of continuous engine operation, they turned the switches off and charged it to experience.

Industry Already Attracted

There is a growing feeling throughout the west that projects including Hungry Horse—which will develop 285,000 kw of power—are part of a gigantic scheme by economists to socialize the electric-power industry and control the economic outlook of a vast area. According to many advocates of that thought, including many of the local papers, the projects are not justified.

According to the Bureau of Reclamation, however, electric power is "vitality needed" in the west, and the production of that power—with attendant flood-control and recreational benefits—justifies its cost.

Regardless of which side is truthful, it can be said that the construction of the giant dam has already attracted private industry to the area. Negotiations are now under way for private enterprise to build a huge aluminum plant near Columbia Falls, to be run by power from Hungry Horse. By October 1, 1952, the USBR expects to have the first great turbine on the line, churning power from the icy green waters of the Flathead. Meanwhile, some control of the Columbia River stages downstream can be expected after the stoplogs block the river early in 1952.

Personnel

Many men are having their own part to play in the construction of the dam. A few of the key contractor supervisors include Project Manager C. W. Wood, Project Engineer R. W. Jones, Dam Superintendent E. L. Simpson, Powerhouse Superintendent C. T. Moyer, Aggregate Plant Superintendent Oliver Dumay, and Concrete Superintendents Rudy Solquist, Les Gardner, and Art Wilson.

L. N. McClellan is Chief Engineer of the U. S. Bureau of Reclamation, with

field operations under Clyde H. Spencer.

The joint-venture contractors who plunged together to build the big structure include General Construction Co., The Shea Co., Morrison-Knudsen Co., Inc., F & S Construction Co., J. L. McLaughlin, S. Birch & Sons, Pacific Bridge Co., Kaiser Co., Walsh Construction Co., Peter Kiewit Sons' Co., J. C. Boepsflug Construction Co., and Gilpen Construction Co.

Uses of Douglas Fir

"Where to Use Douglas Fir Lumber", a 16-page 2-color booklet featuring "the world's most versatile wood", has been prepared by the West Coast Lumbermen's Association, 1410 S. W. Morrison St., Portland 5, Oreg. Fully illustrated, this new reference catalog covers the properties, characteristics, and grades of Douglas fir. It lists recommended grades for interior and exterior uses.

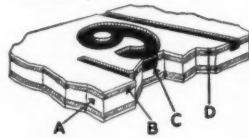
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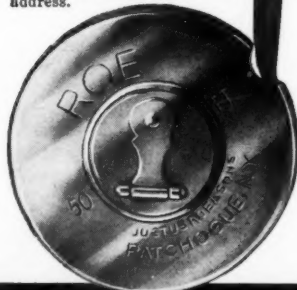
FIRST AND FOREMOST, Roe Steel Tapes are extremely easy to read... and they go right on being clearly legible year after year. The black markings are permanently etched into the steel which is then nickelplated to provide a lustrous contrasting background. A transparent plastic overcoating is added for topmost wear resistance—and durability.



A—Steel tape
B—White nickel
C—Black etched markings
D—Plastic overcoat

Pictured here is the Roe Steel Tape #302 with polished chromeplated, sturdy welded steel case. Other Roe models feature cases in handsewn leather, and in metal-banded leather and leatherette. They have a reinforced rust resistant liner, precision winding drum, flush-folding handle, press button center and roller mouthpiece. All are available with 25, 50, 75 or 100-foot tapes; feet in inches and eighths, or in tenths and hundredths.

Get Roe Steel Tapes from your hardware dealer—or write us giving his name and address.



JUSTUS ROE & SONS

Makers of fine steel tapes since 1876

PATCHOGUE, NEW YORK

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Heavy Duty TRAILERS

ON YOUR WAY WITHOUT DELAY...

KEEP your equipment earning money! For fast, safe job-to-job transportation get the Jahn Heavy Duty Trailer in the size and model that meets your needs.

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PRESSED STEEL CAR COMPANY, INC.
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Chicago 2, Illinois

5 TONS TO 100

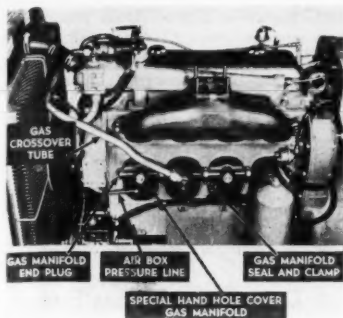
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By moving a small lever on the gas-governor assembly, you can now convert the General Motors Series 71 diesel engine to burn natural gas with a pilot charge of diesel fuel. A change-over kit is available for engines that are already in use.

Dual-Fuel Engines

A new option which enables the Series 71 diesel engines to burn natural gas has been announced by Detroit Diesel Engine Division, General Motors Corp., 13400 W. Outer Drive, Detroit 28, Mich. This option is available on both new engines and engines already in use. For the latter, a factory-engineered kit is available for the changeover.

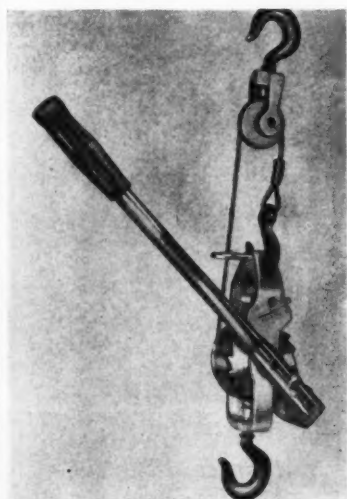
The changeover permits the engines to burn either natural gas with a pilot charge of diesel fuel, or diesel fuel alone. There is no interference with the operation of the unit as a straight diesel-fuel engine when required, according to the manufacturer. Change of operation is accomplished by moving a small lever on the gas-governor assembly. The changeover permits the economy of natural gas whenever available and affords maximum flexibility between the two forms of operation, the company states.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 354.

New 1½-Ton Winch

A new 1½-ton winch hoist has been announced by The Lug-All Co., 331 E. Lancaster Ave., Wynnewood, Pa. It has a 30 to 1 power ratio and is fully tested to a 100 per cent overload for added safety. Standard features of the Lug-All include preformed flexible aircraft cable, stainless-steel fittings and springs, and oiled-for-life bearings. The handle is reversible and acts as a "safety valve" to protect the user. If a rigging must be left overnight, the handle can be removed in 10 seconds, leaving the setup tamperproof.

Three swivel hooks and a built-in pulley block allow work to be done around corners, and as close as 10 inches at the ¾-ton rating. Locking is said to be positive and automatic. The hoist can be operated in any position,



"Husky but light" is Lug-All's description of its new 1½-ton winch hoist. The hoist has a 30 to 1 power ratio, and is fully tested for safety.

and may be set for forward, reverse, or free-wheeling. Ten feet of cable winds out of the way onto the drum. Extensions of any length are available for extra reach.

The Lug-All can be used for moving machinery, lifting engines, repairing belts and conveyors, pulling wire and cable, lining up concrete forms or mats, lifting pipes and unit heaters into position, pulling equipment onto trucks, or binding loads.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 383.

FWD Men Start 1951 Right

The Four Wheel Drive Auto Co., Clintonville, Wis., promoted H. G. Engel from Manager of its Western Sales Zone to Office Sales Manager, and V. M. Anderson from District Sales Supervisor in northern Illinois to Mr. Engel's former position, just in time to give them an additional reason for celebrating the new year.

NEW IMPROVED

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HI-LECTRIC

CONCRETE VIBRATOR

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No Flexible Shaft

9500 Vibrations a Minute

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1 TwinDual Pacemaker Rock Plant

3 TwinDual Master Gravel Plant—double the output of conventional two-stage plants of comparable size and weight

2 TwinDual Gravel King—three stages of crushing, two screens for pits with large boulders

4 TwinDual Secondary with 546P Primary. High capacity with two portable units for quarry operation

UNIVERSAL'S TWIN DUAL PLANTS FOR ROCK AND GRAVEL

Out in front! Universal TwinDual Plants are breaking production records and cutting costs per ton on finished aggregate.

Universal "Stream-Flo" engineering does it with the TwinDual Method—the modern system of crushing and screening that gives three full stages of reduction with only two crushers. You get more production, less jaw and roll shell wear, longer life, less maintenance.

Before you make an investment in a crushing, screening and loading plant for rock or gravel investigate the profitable bonus you get with a TwinDual installation. Compare TwinDual Plants with the field. Get the facts now.

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Phone 7105

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Phone SP aulding 2-9300



**How many crushers do you need?
for 3 full stages of reduction?**

The TwinDual Method does it with two—
First Stage—Jaw Crusher
Second and Third Stages—TwinDual Rolls

Hot-Mix Will Pave New Jersey Turnpike

Asphaltic concrete will pave the 118-mile New Jersey Turnpike. According to the competitive bids received by the Turnpike Authority, asphaltic concrete, as selected, would cost \$39,403,284, while portland-cement concrete would cost \$44,823,418, a difference of \$5,420,134.

"This difference," said Paul L. Troast, Chairman of the Authority, "would involve an additional investment and interest charges which are not justified economically in view of the assurances from our engineers that the asphaltic concrete will provide an excellent highway . . . the equivalent of portland-cement concrete, and after a reasonable evaluation of maintenance costs in each case." The Authority also decided that the use of asphaltic concrete would probably be least affected by today's critical situation in regard to materials supply.

The pavement will consist of 4½ inches of hot-mix laid over 8 inches of penetration bituminous and water-bound macadam, with both laid over a gravel base with a minimum thickness of 6 inches. The total thickness of the pavement and the frost-free foundation material will range from 36 to 42 inches for a two-lane roadway, depending on surface sloping and requirements for drainage.

Inner and outer shoulders of the Turnpike will be of different surface material to provide a contrast and to act as a guide to traffic. From the Raritan River to the northern terminus near the George Washington Bridge, shoulders will be the F type having a compacted thickness of 10 inches, with base courses of compacted gravel or broken stone and a top 3-inch course of penetration macadam. From the Raritan River to the southern end at the Delaware Memorial Bridge, shoulders will be type G, with a compacted thickness of 10 inches and consisting of courses of pit-run gravel or crusher stone with a double bituminous surface treatment.

One Wood-Shop Tool Can Do the Job of 5

A new woodworking tool developed by the Magna Engineering Corp., 417 Montgomery St., San Francisco, Calif., is designed for use as an 8-inch circular saw with extension table, 15-inch vertical drill press, 33-inch lathe, 12-inch disk sander, or a horizontal drill press. The Shopsmith is available with 48 accessories for conversion into a jointer, shaper, drum sander, mortiser, jigsaw, flexible-shaft machine, or any of a number of other power tools. Conversion from one of the tools to another takes about one minute, the company says. A single motor, one headstock,



The Shopsmith, it is called. It can be used as an 8-inch circular saw with extension table, 15-inch vertical drill press, 33-inch lathe, 12-inch disk sander, or a horizontal drill press. It is available with 48 accessories.

and one bench provide the complete workshop unit. The Shopsmith takes up a floor area of 18 x 60 inches.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 385.

New Wellpoint Pump

A new small-sized wellpoint pump has been developed by Complete Machinery & Equipment Co., Inc., 36-40 Eleventh St., Long Island City 6, N. Y. It is powered by a Wisconsin VP4 4-cylinder air-cooled gasoline engine, and may be adapted for diesel or electric-power operation if desired. The new 4-inch unit has an operating speed of 1,800 rpm and a capacity of 800 gpm against a 50-foot head.



This new small-sized Complete wellpoint pump has an operating speed of 1,800 rpm and a capacity of 800 gpm against a 50-foot total head.

The new Complete unit is a bronze-fitted side-suction open-impeller ball-bearing centrifugal pump with a special air-separation chamber arranged to

separate air and gases from withdrawn sub-surface water. The pump and power unit are mounted on a 2-wheel pneumatic-tired carrying chassis that can be towed behind any vehicle. It is adaptable to any size or type of well-point system, the manufacturer says, and is fitted with a special outlet which may be used for jetting purposes.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 312.

Graver Advances Fox

R. A. Fox now manages the operations of the Graver Construction Co. in this country and abroad. He formerly served as Field Assistant to the late company head, E. B. Heyden.

GUTS

When two-legged people have guts, they finish the fight and do the job.

Real guts—that's what the world admires—man or machine.

You can't define what makes guts in a man, but you can "analyze" the fighting, working, dogged innards of the Champ. So let's put the X-ray on the TD-24:

Drawbar Horsepower: 148 working horsepower delivered at the drawbar in official tests.

Synchromesh Transmission: you "shift on-the-go," with eight speeds forward, eight reverse for faster time cycles with more pay dirt per cycle.

Instant Speed Change: up or down one speed without declutching.

Planet Power Steering: all turns are easier . . . pivot turns, feathered turns, turns with power on both tracks.

Reserve Torque: gives the Champ the lugging ability to fight through temporary overloads.

Easy Steering: finger-tip hydraulic controls.

All-Weather Starting: push-button, gasoline-conversion starting—an International exclusive—gets you on the job fast.

More Work: the TD-24 is doing more work—with more speed and more lugging ability—than any other crawler tractor on the market.

Look it over. Then ask your International Industrial Distributor to show you what it can do for you. You'll be a TD-24 man from then on in.

INTERNATIONAL HARVESTER COMPANY
CHICAGO 1, ILLINOIS

POWER THAT PAYS

INTERNATIONAL

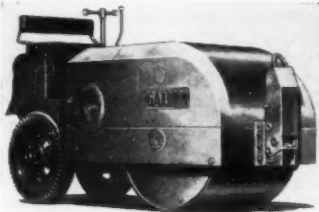


New Portable Roller

Several advances have been claimed for the new variable-weight portable roller made by The Galion Iron Works & Mfg. Co., Galion, Ohio. Steering is now done by hydraulic power under fingertip control. A spur-gear final drive replaces the chain drive of former models, and a constant-mesh transmission eliminates gear clashing and provides smooth gear shifting, the company says.

Other features include easily adjusted Twin Disc over-center forward and reverse clutches, and a hydraulically-operated towing hitch which folds back compactly against the roller housing when not in use.

The compaction effectiveness of this



Hydraulic steering, spur-gear final drive, and constant-mesh transmission are features of Galion's new variable-weight roller.

Galion portable roller is said to equal that of a 5 to 7-ton tandem roller. Compression under roll, without water ballast, is listed at 130 pounds per inch of roll width. With 2,300 pounds of

water added to the roll, compression is raised to 192 pounds per inch. The compression roll is 48 inches in diameter and 42 inches wide. It is fitted with mats and a sprinkler system.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 399.

Drill Bit Repaired

The Tilden Tool Mfg. Co., Pasadena, Calif., manufacturer of the patented rotary Konkrete Kore drill, has extended its facilities to include repair and sharpening service of Kore Bore drills. The announcement will be of interest to owners of the latter type of drill, since it has now been withdrawn from the market.



A high-pressure air-supply tank and control valves are an integral part of Gar-Bro's Model A concrete bucket.

New Bucket Features Integral Air Control

A new concrete bucket with integral high-pressure air-supply tank and control valves has been announced by Gar-Bro Mfg. Co., 2416 E. 16th St., Los Angeles, Calif. Features of the air-operated Model A bucket are pull-chain-controlled valves that eliminate the necessity of hose, connectors, and air supply at the dumping location.

The double clamshell gates are grout-tight and nonclogging and have a center discharge dumping straight down. These air-operated gates provide positive control for releasing any portion up to a full load and can be operated by remote control if desired. All sizes of Model A Gar-Bro buckets can now be equipped with high-pressure air tanks and controls. Chutes and hoppers are made to fit the buckets.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 342.

A New 200-Ampere Transformer Welder

A new 200-amp transformer welder has been announced by Air Reduction Sales Co., A Division of Air Reduction Co., Inc., 60 E. 42nd St., New York 17, N. Y. The latest development in the Wilson line, it is 12 x 17 x 23 inches high and is designed to cover a wide range of applications.

The Airco MCX has a full 200-amp, 50 per cent duty cycle, NEMA rating. Three current ranges selected by insulated, tapered, plug connectors and infinite hand-crank adjustments within each range provide currents from 30 to 250 amperes. This permits the use of 1/16 to 3/16-inch-diameter electrodes.

The Silicone insulation provides a high margin of safety two ways, Airco states. It enables the welder to operate safely at high temperatures without breaking down, and it is water-repellant. The welder employs an automatic hot-start control with a hermetically sealed gas-filled time-delay relay magnetic switch that has no open contact.

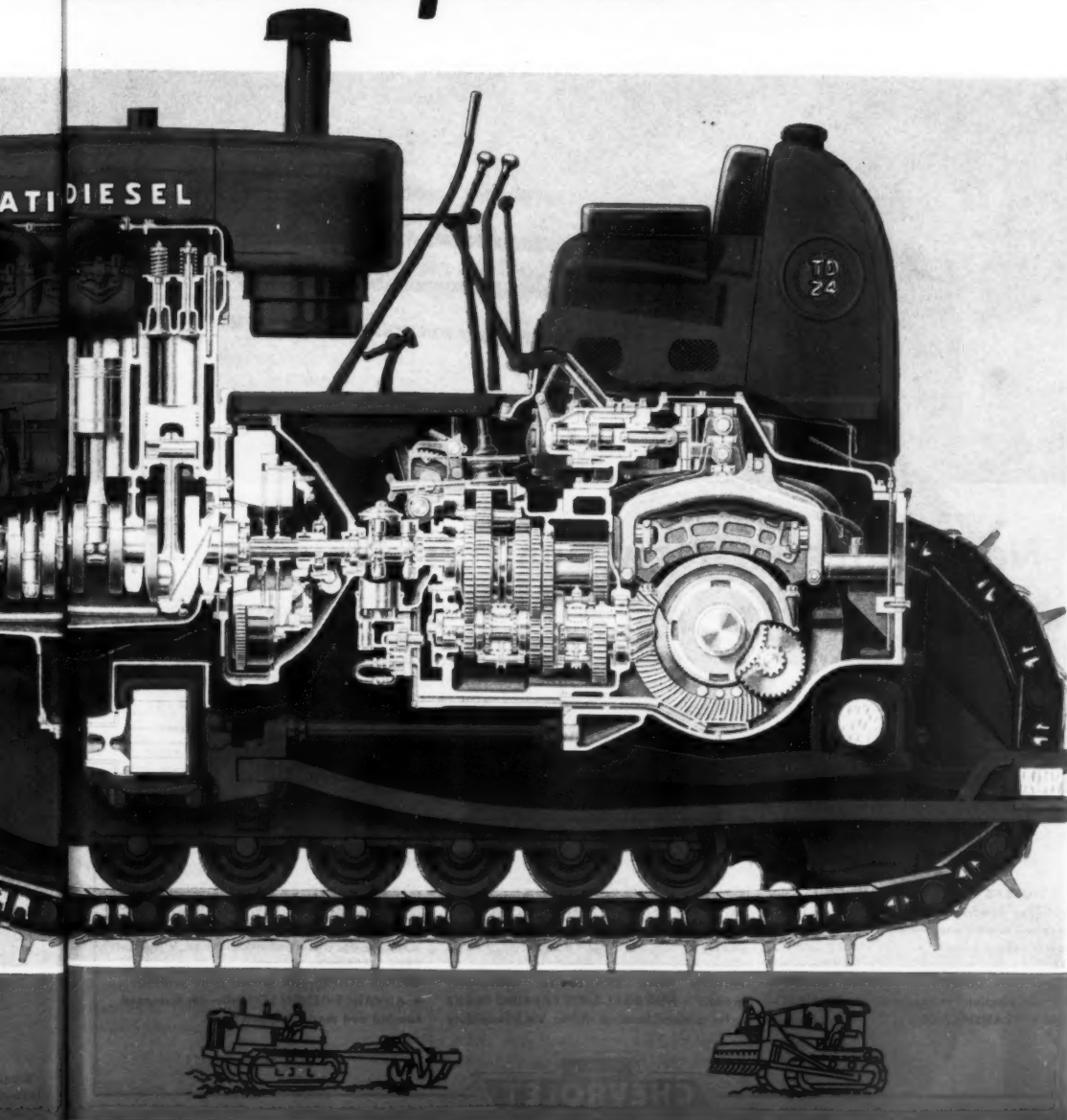
Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 268.



The Airco Model MCX 200-amp transformer welder.

OF A CHAMP

inside story of the TD 24



Canal Is Filled In For New Expressway

First Step in Railroad-Consolidation for New Orleans; Shells From Lake Serve as Fill

♦ DURING the last century thousands of laborers dug by hand the New Basin Canal from Lake Pontchartrain, La., into the heart of New Orleans. Hundreds died from fever and malaria in the slow course of the work. Today, a few men and machines are rapidly filling in parts of that canal with clamshells dredged from Lake Pontchartrain, as the first major step in the far-reaching railroad-consolidation program for the Crescent City on the Mississippi. The filled-in canal will become Pontchartrain Expressway, a Federal-Aid urban interregional highway.

A portion of this right-of-way is also to be made available as a north-south railroad approach to the one new passenger station which will be constructed to accommodate all railroads serving New Orleans. This station, to replace the five passenger stations now obsolete and inadequate, will be the sole terminal for the nine trunk-line railroads entering the city. It will be located on the site of the present Union Station on South Rampart Street between Calliope Street and Howard Avenue.

Originally, New Basin Canal extended from Lake Pontchartrain into New Orleans as far as South Rampart Street, a little over 6 miles in length. A couple of decades ago, a short stretch at the upper end of the waterway was filled in, terminating the canal at South Claiborne Avenue. Under the railroad-consolidation program, two-thirds of the canal is being filled in by the State of Louisiana, and the remaining one-third by the City of New Orleans to be paid for by the railroads.

The portion now under way, and financed by the State, extends from a

point near General Ogden Street to the head of the canal at South Claiborne Avenue, nearly 2½ miles long. The Louisiana Department of Highways awarded a contract for this work to Jahncke Service, Inc., of New Orleans on its low bid of \$1,375,851.37. The major item in the contract calls for the placing of 705,000 cubic yards of fill to displace the water in the canal.

New Basin Canal

The New Basin Canal is an old and little-used navigational slip or water-



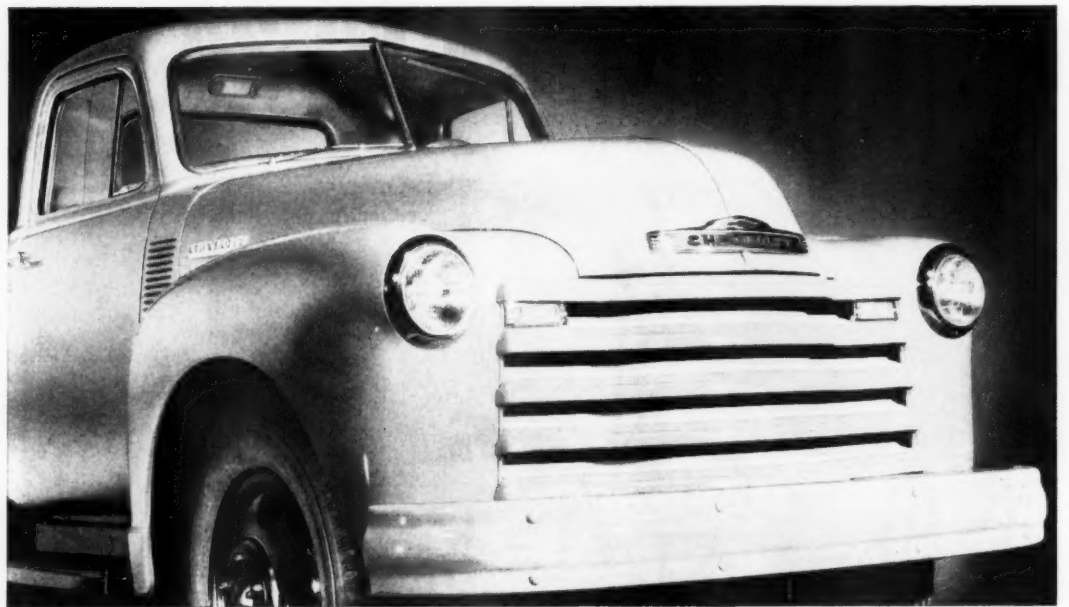
C. & E. M. Photo

Jahncke used a P&H crane on a steel barge to handle the clamshell fill for the New Basin Canal in New Orleans. It had a 60-foot boom and a Blaw-Knox clamshell bucket. This view up the canal basin was taken from a point near Claiborne Avenue.

way that bisects this metropolis of the Deep South. In its early history the canal carried heavy freight tonnages,

but in late years water traffic had diminished to practically nothing but
(Continued on next page)

NEW 1951 CHEVROLET ADVANCE-DESIGN TRUCKS



New FEATURES! New QUALITY! New VALUE!

You'll find everything in these new 1951 Chevrolet trucks—everything that has made Chevrolet the world's most popular make *plus* new features and improvements that put them still farther ahead of the field. As a truck user, you'll welcome Chevrolet's new, better designed brakes for their increased effectiveness . . . their thrifty long life and extra safety! You'll recognize important

contributions to trucking in Chevrolet's Dual-Shoe parking brake, the new Ventipanes, and Chevrolet's new cab seats . . . the very tops for riding comfort! See your Chevrolet dealer and take a good look at these 1951 Chevrolet trucks at your first opportunity. The "best in the business" are better than ever today! Chevrolet Motor Division, General Motors Corp., Detroit 2, Mich.

CHEVROLET ADVANCE-DESIGN TRUCK FEATURES

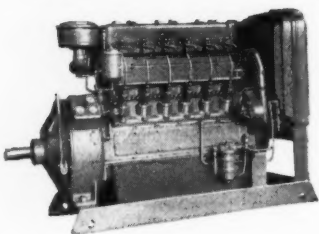
TWO GREAT VALVE-IN-HEAD ENGINES—the 105-h.p. Loadmaster or the 92-h.p. Thriftmaster—to give you greater power per gallon, lower cost per load • POWER-JET CARBURETOR—for smooth, quick acceleration response • DIAPHRAGM SPRING CLUTCH—for easy-action engagement • SYNCHROMESH TRANSMISSIONS—for fast, smooth

shifting • HYPOID REAR AXLES—for dependability and long life • NEW TORQUE-ACTION BRAKES—for light-duty models • PROVED DEPENDABLE DOUBLE-ARTICULATED BRAKES—for medium-duty models • NEW TWIN-ACTION REAR BRAKES—for heavy-duty models • NEW DUAL-SHOE PARKING BRAKE—for greater holding ability on heavy-duty

models • NEW CAB SEATS—for complete riding comfort • NEW VENTIPANES—for improved cab ventilation • WIDE-BASE WHEELS—for increased tire mileage • BALL-TYPE STEERING—for easier handling • UNIT-DESIGN BODIES—for greater load protection • ADVANCE-DESIGN STYLING—for increased comfort and modern appearance.



CONTINUOUS
DEPENDABILITY
FOR OVER 50 YEARS



POWER UNITS

12 to 60 hp.
2, 4 and 6 CYLINDERS



HILL DIESEL ENGINE CORP.
LANSING, MICHIGAN

pleasure craft. The railroads had cut in on water haul transportation, and when the Inner Harbor Navigation Canal was completed in 1923, the older New Basin Canal had all but outlived its usefulness. The Inner Harbor Navigation Canal, or Industrial Canal as it is also called, connects the Mississippi River and Lake Pontchartrain by cutting across the eastern section of New Orleans.

The width of the New Basin Canal varies from 110 to 134 feet. Along the west side is a channel 60 feet wide, with a 12 to 14-foot depth of water. This depth decreases along a sloping bottom to the east bank. Normal elevation of water in the canal is at plus 6.0. Contract specifications required that the canal bottom be cleaned out down to minus 5.0 elevation before any fill was placed. Accordingly Jahnce Service, Inc., divided the job roughly into two sections, built a dike across the canal at the division point, and proceeded to unwater the upper section of the waterway.

The dike was built of clamshells dredged from Lake Pontchartrain, and dumped across the waterway to form a barrier about 100 feet wide on top. This shell material drained well, so that within half an hour after the dike had been built up to grade, a P&H 655 crane rig was run out on its crown. With this machine a row of steel sheet piling, 134 feet in length, was driven across one side of the shell dike to prevent seepage. Sheet piling lengths varied from 14 to 30 feet.

Unwatering and Cleaning

Before the dike had been built across the canal, floating equipment including dump scows had been towed into the upper end that was to be cleaned out first. Then the level of the water in this enclosure was lowered from 7 to 8 feet, while still leaving about 6 feet of depth in the channel portion as flotation for the equipment. Unwatering such a large area to such a depth would present a major problem in most parts of the country. But in New Orleans, where the terrain is low and flat and even below sea level over a large area, a highly efficient system of handling storm drainage has been developed—a vital necessity on more than one occasion. From the canal 36-inch drains connect to the city drainage system so that heavy rainfall, or excess water blown into the canal from Lake Pontchartrain, can be quickly drawn off by the great suction pumps that are part of the city's drainage system.

Within 50 hours this 7,400-foot section of canal had its water level lowered 7 feet. Exposed to view was a great mass of refuse and debris that had accumulated over the years on the bottom of the canal, including everything from discarded auto tires to wrecks of old boats and abandoned wharf piling. This junk was gathered in by cranes mounted on floating barges in the channel along the west bank of the canal, or by truck cranes operating along the east bank. In addition a crew of laborers clad in rubber wading suits worked over the bottom to help load the buckets off the rigs.

About 15 barges were filled with debris, along with some 60 truck loads of material by the equipment working on shore. Material on the trucks was hauled away to dumping grounds. The dike was opened up by dozers to permit the exit of the barges from the cleaned-up section of canal. Their loads were used as land fill in low areas bordering the Industrial Canal. Cleanup operations in this first section of canal started on January 6, 1950, and required three months to complete, the last load being hauled away on April 5.

Clamshell Fill

As soon as the bottom was cleaned, the job of backfilling the big ditch got under way. The section of canal had

filled up again with water, of course, as soon as the dike had been opened at the lower end. The problem of getting material to fill in the canal was easily solved by tapping a huge and ancient deposit of clamshells lying on the bottom of Lake Pontchartrain in from 12 to 14 feet of water. The shells were dredged from the muddy lake bottom by the Jahnce dredge Captain Eddie equipped with a 14-inch pump. The cutterhead hydraulic dredge had a wash plant on its deck for thoroughly cleaning the shells before they were loaded by chutes into barges tied alongside.

As many as 32 barges, holding from 400 to 800 cubic yards of shells each, were used in hauling the material from the dredge to the canal, an average distance of 18 miles. A typical steel barge used in this work measured 120 feet long x 30 feet wide x 8 feet deep. All the load was carried above the deck of the barge, with the material retained by bins from 4 to 5 feet high. No hopper-type barges were used because of

the draft requirements, and also because the deck method of loading permitted the easy runoff of excess water that was used in the washing and loading operations.

From 3 to 5 barges were made up into a tow. These tows were moved across the lake to the entrance of the canal by sea-going tugs. Smaller tugs then took over for the trip through the canal, so as to release the larger vessels for

the lake passage. Five tugs—three large and two small—handled the towing assignments with the barges. The dredge worked around the clock, pumping shells from the lake at the rate of from 250 to 300 cubic yards per hour.

Placing the Material

In order to trap the layer of mud on the bottom of the canal, compress it in
(Concluded on next page)



LANSING F4-1/2 WHEELBARROW

The most popular wheelbarrow on the market for handling wet concrete. Ask your dealer or write direct to Lansing or one of our warehouses.

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LANSING, MICHIGAN

Builders of wheelbarrows for over 68 years

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CP PORTABLE COMPRESSORS—ruggedly built; designed for dependability, long service, low maintenance. CP Gradual Speed Regulator, adjusting engine speed to air demands, minimizes engine wear, gives smoother performance, effects fuel savings ranging from 15% to 35%. Compressors are available in gasoline-driven models from 60 c.f.m. to 315 c.f.m.; in Diesel-driven sizes, from 105 c.f.m. to 500 c.f.m.



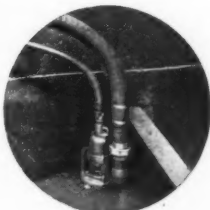
YOU CAN DEPEND

on CP Equipment



G-150 light-weight CP WAGON DRILL is designed for use with new CP 59-lb. Sinker or 3-inch Drifter. Increases footage up to 100% over hand-held methods. Write for SP-3010.

CP-20 SUMP PUMP operating with 60 c.f.m. compressor at 40 lbs. pressure against a 15-ft. head, has capacity of 200 gallons a minute; with a 105 c.f.m. compressor at 80 lbs. pressure against a 50-ft. head, 225 gallons a minute. Requires no priming. Write for SP-3017.



CP-220 HICYCLE ELECTRIC VIBRATOR—one-man operation; no flexible shaft; easily handled electric cable can be bent around corners, over forms. Powered by gasoline-driven generator, vibrator can be used anywhere within 400-ft. radius without moving generator. Write for details.



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TOOL COMPANY**

General Offices: 8 East 44th Street, New York 17, N. Y.

PNEUMATIC TOOLS • AIR COMPRESSORS • ELECTRIC TOOLS • DIESEL ENGINES
ROCK DRILLS • HYDRAULIC TOOLS • VACUUM PUMPS • AVIATION ACCESSORIES

Canal Is Filled In For New Expressway

(Continued from preceding page)

place, and prevent its shifting about, a course of shells from 3 to 5 feet deep was first spread over the entire section beginning at the upper or closed end of the waterway. This initial shell blanket was always kept from 1,000 to 1,500 feet ahead of the rest of the fill being placed in mass.

As the shell-laden barges were brought up to the site of the work, the shells for the blanket course were unloaded by a floating rig. This consisted of a steel scow on which was mounted a P&H crawler crane equipped with a 60-foot boom and a Blaw-Knox 1½-yard clamshell bucket. The rest of the clamshell fill was handled by a Bucyrus-Erie 54-B crawler rig operating along the west bank. This crane had a 100-foot boom and an Owen 2½-yard clamshell bucket. Where this crane could not reach to the opposite bank, the floating rig took care of the mass-fill placing along the east shore of the canal.

Gradually the clamshells displaced the water in the long hole, as the barges and cranes worked out in the direction of the lake. After the first section that had been cleaned was filled in, another dike was built at the lower end to permit the unwatering and bottom cleaning of the rest of the contract. Then the remainder of the canal was backfilled with the hard-packing clamshells. Dozers leveled the top off to grade. Shells accounted for all the fill material with the exception of about 30,000 yards of dirt that composed a section of levee along a portion of the east bank of the canal. The levee was degraded to serve as fill also.

Personnel

This first contract on the filling-in of New Basin Canal is expected to be completed early this year. Jahneke Service, Inc., is employing a force averaging 100 on the work under the direction of Edgar L. Franks, Superintendent.

For the Louisiana State Department of Highways, H. T. Richardson is Project Engineer. The Department is headed by R. B. Richardson, Director. N. E. Lant is Chief Engineer, and W. J. Hughes is Construction Engineer.

Other Work

When the state and city work on filling-in the canal is completed, the Pontchartrain Expressway over this newly made ground will run from the heart of the city northward to tie in to the Airline Highway, U. S. 51, 61, and 65, to Baton Rouge and points north. Tracks for the Southern Railway and Louisville & Nashville Railroad lines will also be laid on this new right-of-way for approaches to the terminal yet to be built. The new track layout will be responsible for the future construction of two vehicular underpasses and three overpasses crossing this alignment.

Construction of the Pontchartrain Expressway is only a small part in the overall railroad-consolidation program for New Orleans which will cost nearly \$40,000,000. The rest of the program includes the railroad station and approaches; 24 new grade-separation structures; paving, widening, and extension of city streets involved in the improvement; and track rearrangement by the various rail companies.

Saratoga Street, an arterial street servicing the new station, is now being widened. Overpasses at North Claiborne Avenue and Galvez Street on the Southern and L. & N. rail lines are now under way. A new overpass has already been constructed at Elysian Fields Avenue, and the latter thoroughfare has likewise been widened. The advantages incidental to the new station in the railroad-consolidation program

include the elimination of 82 grade crossings as a result of the track rearrangement, a safety feature of great importance. The only crossings that will still be at grade, on the completion of the program, will be at secondary streets with little-used freight tracks.

Funds to finance the work are being derived from: (1) a municipal bond issue, (2) revenue bonds issued by the city but secured and paid for by the railroads, (3) state highway funds, (4) Federal Aid, and (5) the railroads. The railroad terminal will be built in the name of the city which will retain title to the property at all times, regardless of the status of the bonds.

The interests of the City of New Or-

leans in the railroad-consolidation program are handled by the Department of Public Safety, Division of City Traffic Engineering. The Department is headed by Bernard J. McCloskey, Commissioner, and Kenneth M. King, Director.

Fred Lavis Dead

Fred Lavis, retired consulting engineer and authority on railroad and highway transportation, died recently in Phoenix, Ariz. He was 79 years old.

Mr. Lavis, who began his career as a rodman in the office of a Boston surveyor, was at one time President of the International Railways of Central America.

From 1905 to 1909 Mr. Lavis was a resident engineer on the Pennsylvania Railroad's North River tunnels into New York. Later he engaged in private engineering practice, specializing in South and Central American railroads. He did railroad engineering in Spain, Italy, and China, and served as a consulting engineer on the construction of the Panama Canal.

From 1924 to 1928, as an engineer for the New Jersey State Highway Commission, he located, designed, and helped build superhighways through congested parts of the state. He served as consulting engineer to the Ministry of Public Works in Venezuela from 1938 to 1944.

now
TWO MORE

Completely new

HD-9

WEIGHT: 18,500 lb.
70 DRAWBAR Hp.
GM 4-71 DIESEL ENGINE
SPEEDS: 6 forward, to 5.68 mph.;
3 reverse, to 4.43



OUT AHEAD

Modern Allis-Chalmers Line
sets New Tractor Standards



ALLIS-CHALMER
TRACTOR DIVISION • MILWAUKEE 1, WIS.

The World's Most Modern Line of Crawler Tractors

Each of these tractors gives you a new kind of plus new strength, and service simplicity in crawler tractor. Allis-Chalmers dealer

Information on Low-Bed

Trailers; 10 to 75 Tons

Circulars describing four different models of the Dorsey low-bed heavy-duty trailers are offered by Dorsey Trailers, Elba, Ala. All models, the literature points out, are available as semi or full trailers, with level or drop decks.

Model MK comes in 10 and 15-ton capacities and has 4 rear tires mounted on a single axle line. Model M is available in capacities of 15, 20, and 25 tons, and features 8 tires mounted on a single axle line. The MTS ranges in capacity from 15 to 35 tons, in 5-ton increments, and is rated as a 2-axle trailer. Capac-

ities for the Model MT range from 35 to 75 tons. This unit features 8 steel-spoke dual wheels mounted on four oscillating axles, set in tandem on walking beams.

The circulars illustrate each model, provide a brief description, and include specifications and dimensions.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 266.

Surveying Instruments

A new 40-page catalog, Bulletin No. 1050, describing a full line of surveying instruments and other aids for engineers, surveyors, and builders, can be

secured from David White Co., 315 W. Court St., Milwaukee 12, Wis. It contains complete and detailed information on the company's line of transits, levels, transit boxes, tripods, hand levels, alidades, and accessories; the last include such things as plumb bobs, tapes, hand levels, a brush knife, steel marking pins, and compasses. Each of the surveying instruments is illustrated, and a cross-section drawing of the engineer's transit shows all its working parts. Complete specifications and a price list are provided for each piece of equipment.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 310.

Prelubricated Bearings

A prelubricated bearing for electric motors, said to provide more hours of operating life without relubrication than any other prelubricated bearing, is the subject of Bulletin B-2201 prepared by Reliance Electric & Engineering Co., 1088 Ivanhoe Road, Cleveland 10, Ohio. The folder contains descriptive sketches, cutaway drawings of the improved double-shielded bearings and their bracket mounting, and a check list which compares other bearing arrangements with the Reliance design.

This literature may be secured from the company, or by using the Request Card at page 16. Circle No. 370.

Allis-Chalmers Tractors

NEW POWER RATING

POWER, WEIGHT, BALANCE put them in a class of their own — never such traction... such pulling, pushing or lifting ability. And the smooth-operating GM 2-Cycle Diesel engines work without strain under the most extreme conditions.

NEW STRENGTH

All parts are designed and built to carry their loads with a margin of safety. No need to go to a larger tractor just for strength alone. The HD-9 and HD-15 set new standards for tractor quality.

- ✓ For Greater Production
- ✓ For Easier Operation
- ✓ For Simplified Servicing

NEW DESIGN SIMPLICITY...

for Easier Control and Greater Operator Comfort — Easy-shift transmission • Self-energizing brakes • Booster steering controls • Adjustable, cushioned seat • Wide arm rests • Convenient controls and pedals • Full visibility • Instant electric starting.

for Simplified Servicing — Unit construction permits removing major assemblies without disturbing companion groups • Extended lubrication periods throughout — 1,000 hours on truck wheels, idlers and support rollers.

Complete Line of Matched Equipment,
Developed in Cooperation With
Allied Manufacturers, Avail-
able For Both The HD-9
and HD-15.

HD-15

WEIGHT: 27,500 lb.
102 DRAWBAR Hp.
GM 6-71 DIESEL ENGINE
SPEEDS: 6 forward, to 5.80 mph;
3 reverse, to 4.51



Roadside Development Shows Steady Growth

C&E Monthly Survey Indicates That Nearly All States Have Programs for Developing the "Complete" Highway

By WILLIAM H. QUIRK,
Eastern Editor

♦ **ROADSIDE** development has shown a remarkably steady growth in nearly all the state highway departments and road commissions of the country. A recent survey by **CONTRACTORS AND ENGINEERS MONTHLY** indicates that, of the 42 states replying, only two carry on no roadside improvement at all. At least forty states have, as part of their highway work, more or less definite programs for the development of the road-sides that border the ribbon of pavement along the highway right-of-way.

These roadside features in the development of the "complete" highway include such major components as slope stabilization and erosion control; planting of trees and shrubs; roadside parks, waysides, picnic and/or parking areas. Roadside maintenance, of course, is an accepted concomitant of any or all such improvements. Considerable latitude exists in many states as to the scope of activities grouped under roadside development, roadside improvement, landscaping, forestry, or beautification, to list some of the names this work is called. It ranges in diversity from the removal of highway advertising from right-of-ways in scenic New Hampshire, to live-snow-fence plantings on the wind-swept plains of Minnesota.

How this work is administered also differs greatly among the various states. Already nine highway departments have separate divisions or bureaus in which the man in charge is responsible solely to the commissioner, chief engineer, or his principal assistant. These states having roadside-development units that are not allied with some other branch of the highway department are Connecticut, Rhode Island, New York, Wisconsin, Virginia, North Carolina, Tennessee, Arizona, and Oregon.

In the other states roadside work is performed as part of the duties of several different departments such as design, location, construction, maintenance, signs and highway marking. In such cases the landscape architect or roadside-development engineer in charge reports to the highway official administering that specific department. In 20 states, there is no roadside-development or landscape engineer. Maintenance engineers in 18 states exercise general supervision over roadside-improvement programs. Where the program is limited, and still pretty much in the preliminary stages, the roadside work is carried on separately by each department as the need arises.

Slope Stabilizing, Erosion Control

Highway maintenance costs have been lowered, it is generally agreed, through roadside development featuring slope stabilization and erosion control. Forced to choose, when funds are scarce, between seeding, mulching, and sodding on slopes, shoulders, and ditches, and other major roadside attractions such as planting or parks along the wayside, a highway department will invariably pick erosion control as the most benefiting.

Seeding is being done throughout the country every month of the year, but most of it is concentrated between March and November during the spring and fall seasons. The amount that is done varies considerably from state to state, along with the rate of seeding,

according to the soil conditions. This rate has a range from 3 pounds per acre up to 300 pounds per acre, and includes probably every type of grass or legume suitable to soil and climate. In practically all seeding, fertilizer is used, the type and amount varying with the conditions encountered.

For a protective mulch a wide assortment of materials is used. It includes hay, straw, brush, chaff, peat moss, hyper-humus, grass clippings, roadside cuttings or mowings, cottonseed hulls, sawdust, stalks, alfalfa, tobacco stems,



Bureau of Public Roads Photo

This "complete highway"—safe, convenient, attractive, and low in annual maintenance costs—is the result of cooperative effort of highway and landscape engineers working together in design, location, construction, and maintenance.

forest litter, muck, manure, asphalt, and oil.

This type of work is done both by state forces and by contract, either by hand or by machine. Hand operations are gradually being replaced by ma-

chines, either shop or factory-built. Equipment has now come into general use wherever conditions permit, and it is a common sight for straw blowers, rotary mixers, distributors, sod cutters, tillers, tors, machi aratio

(Continued on next page)

THE BAKER

THE NEW BAKER HYDRAULIC & CABLE ROOT RIPPER FOR ALLIS-CHALMERS NO-9, NO-15, NO-20

Introducing 3 NEW ACTORS for your AC Tractors

"An Earthy Show"

The RIPPER

HEADLINERS



On the old-model state highway, at left, where no erosion-control measures were taken, drainage ways were clogged with soil washed down the angular slopes. Above, the same highway after reconstruction. Improved cross-section design and the application of roadside-development principles changed it into this.

tillers, cultivators, disks, harrows, tractors, seeders, spreaders, and allied machines to be working on the preparation of a living green border flank-

ing the strip of paving.

Planting

Planting is expensive, and although

28 states participate in this phase of roadside development, the individual and collective efforts are small. Honey-suckle is a universal favorite for

ground-cover planting, while other growths put to the same use include grasses, blueberry sod, vines of various types, American bittersweet, kudzu, ivy and Bermuda sprigs. In its sand-hill section Nebraska plants rye as a ground cover along the right-of-way of new construction.

Planting of trees and shrubs has for its purpose erosion control, screening, and appearance. On divided highways the planting is an aid to safety. Michigan has found that shrub beds are effective as barriers instead of guard posts in preventing parking on median strips. Planting at intersections has proved a safety measure in some states by defining the traffic lanes more clearly.

Garden clubs and Blue Star Memorial Highway groups have cooperated in providing trees and shrubs, thus augmenting the limited allowance of several states for such supplies. In nearly all sections native trees are selected for planting. They range from the live oaks, magnolias, crepe myrtles, and oleanders of Louisiana, on northward through varying climatic belts to the native firs and cedars of northwestern Washington, or through the hardy flowering dogwood of the east. Deciduous and evergreen trees are used, both functional and ornamental. In addition to those mentioned there are also taxus, juniper, rose-rugosa, pine, maple, privet, willow mat, black locusts, and poplar. Some states with good foresight carefully clear and grub during new road construction, selecting good trees for preservation.

Minnesota's live-snow-fence plantings consist generally of conifer seedlings that are furnished by the State Forestry Department. They are planted on 6-foot centers, or about 1,210 per acre, and make an attractive roadside. A 30-foot solid planting beginning at profile grade on the backslope keeps the waterway clear for mowing. Continued outward, this planting has been found to hold snow from drifting onto the roadway. In several areas this plan has dispensed with the costly erection and taking down of the conventional snow fence.

Roadside Parks and Waysides

Increasing attention is being given by highway departments to the comfort and convenience of the traveling public through roadside parks, waysides, picnic areas, and parking areas. The small parks that have been established by the side of the road for the use of the wayfarer vary greatly in size and appearance from state to state. What one state would consider a roadside park, another might feel is only a slightly expanded picnic-table site. Michigan, with 3,100 roadside picnic tables, leads the field in this classification; benches, posts, and seats are of wood construction. Virginia with 2,000 wooden picnic tables is not far behind; it also maintains 1,200 historical markers along the highways that give a particularly clear though brief

(Continued on next page)

FAMILY THEATRE

FOR THE Smoothest Shave
ON THE FACE OF THE EARTH...

BAKER Blades

THE NEW BAKER
HYDRAULIC & CABLE
BULLDOZERS
FOR
ALLIS-CHALMERS
HD-9, HD-15, HD-20

The STRIPPER

THE NEW BAKER
HYDRAULIC & CABLE
GRADEBUILDERS
FOR
ALLIS-CHALMERS
HD-9, HD-15, HD-20

The GAY BLADE

ON ANY SHOW ANY WEEK!

Producers:

THE BAKER MANUFACTURING COMPANY

SPRINGFIELD, ILLINOIS

Specialists in Hydraulic and Cable-Controlled Earthmoving Equipment for 43 Years



Minnesota's live snow fence traps snow, keeping it off the highway.

Roadside Development Shows Steady Growth

(Continued from preceding page)

account of episodes of the War Between the States.

Connecticut and Ohio have pioneered in roadside picnic areas and parks. The oldest roadside picnic area on a state highway in the country is in the Nutmeg State, which now has 146 such areas. Five were opened during 1950.

At present Ohio has 283 on its highway system, including 12 that were opened last year. These recent additions average 2 acres in size, and like the others have such facilities as water, shelter, toilets, picnic grills, tables, and parking area. Sprawling Texas is far in the lead in numbers, however, reporting 663 parks, with 35 added this year ranging in size from 1/2 acre to 3 acres.

Good progress was made last year with roadside parks when 582 were added to the state highway systems. There are now nearly 3,000 such parks adjoining the highways, and over 10,000 roadside picnic tables for the use of travelers. Also, ten states signify their intention of continuing their program of waysides with future additions as funds permit.

Roadside Maintenance

Three major items come to mind when roadside maintenance is discussed—mowing, tree care, and weed control. Landscape men have definite feelings on these subjects, especially the last two. The mowing season ranges, for the most part, from April to December according to climatic conditions, with the mowing being done as frequently as every two weeks to as infrequently as once a year. In southern Florida mowing is a year-round proposition. Some states mow only the shoulders consistently, while others take in the entire

right-of-way. Practically all mowing is now done by machine, various makes of sickle-bar mowers mounted on light tractors being the most popular way of getting this work done.

Tree care—spraying, cutting, and pruning—is not in general vogue, due to the costs involved. However, the larger landscaping units are usually equipped with spray machines that are put into service when disease or insects threaten the life of the tree. Various insecticides and fungicides are applied



This is the Seven Falls picnic area on Connecticut Route 9—the oldest picnic area on a state highway in the country.

in the strengths that are recommended. Such departments also have on hand power chain saws and hand tools for pruning and cutting. When outside interests, such as public utilities or individuals, wish to tamper with a tree, they are generally required first to

obtain a permit from the Department.

Most roadside-development men feel that weed control is still pretty much in the experimental stage as far as chemicals go. Some tell of bad results, while others report satisfaction. Chem-

(Concluded on next page)

EATON 2-Speed Truck AXLES

Haul More Every Day

More trips with full load whether roads are good or bad—that's the contribution of Eaton 2-Speed Axles to greater truck operating profits. Eaton 2-Speeds have double the conventional number of axle gear ratios. As a result, the tremendous power of today's engines is utilized to best advantage—speed for good roads . . . pulling capacity under full load for tough spots. Regardless of driving condi-

tions, faster trips are the rule—without sacrificing payload. This ability to haul more is the reason that Eaton Axles pay for themselves over and over.

Eaton's performance is made possible by its exclusive planetary gearing, positive lubrication and other features which your truck dealer will be glad to explain.



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EATON MANUFACTURING COMPANY
CLEVELAND, OHIO



PRODUCTS: SODIUM COOLED, POPPET, AND FREE VALVES • TAPPETS • HYDRAULIC VALVE LIFTERS • VALVE SEAT INSERTS • JET ENGINE PARTS • ROTOR PUMPS • MOTOR TRUCK AXLES • PERMANENT MOLD GRAY IRON CASTINGS • HEATER-DEFROSTER UNITS • SNAP RINGS • SPRING TITLES • SPRING WASHERS • COLD DRAWN STEEL • STAMPINGS • LEAF AND COIL SPRINGS • DYNAMATIC DRIVES, BRAKES, DYNAMOMETERS

THE ANSWER TO THE ENGINEER'S PRAYER

BREAKS
CONCRETE
FASTER

TAMPS BACKFILL
BETTER AND FASTER
FOR LESS



THE NEW, MORE POWERFUL MIGHTY "B" MIDGET

Fastest Pneumatic Concrete Breaker and Backfill Tamping. Replaces all the dirt removed after pipe has been laid. Gives you high density compaction. Ready to repave immediately. No temporary paving. No spoil dirt to haul away. Due to high density compaction, requires little asphalt in replacement. Cuts cost of tamping and breaking of concrete many times. Can be worked manually or automatically. 160' Compressor for full capacity or 100' Compressor for 1/2 capacity. For further particulars, see your nearest dealer, or write Department C.

R. P. B. CORPORATION

2781 East 15th Street Los Angeles 23, California

icals chiefly in use are 2,4-D and 2,4,5-T, applied with power sprayers in the battle against the weeds. Sprayers are both truck-mounted and the pull type, while knapsack sprays are handy in spot spraying of poison ivy, thistle, sumac, and such noxious growths.

Roadside Work Mechanized

In the beginning roadside development was essentially a hand operation, but in a few years this aspect has changed radically as mechanization has extended into this field. Machines and equipment are the answer to rising costs, especially in hand labor, thus permitting more extensive roadside work for the same money. Already in use are the power machines—sprayers, mowers, saws, seeders, mulch blowers, mixers, mechanical tillers, harrows, disks, fertilizers, sod cutters, spreaders, burners—and allied equipment.

Some of the tools are standard farm or road machines, or adaptations of them. Others are special machines developed by either highway departments, contractors engaged in landscape work, or interested manufacturers. They are all time-savers. Watching a seed-spraying machine or a mulch blower in action is an impressive argument against the old slow and inefficient method of doing this work by hand. Pegging down a layer of hay with sticks and strings now seems old-fashioned as compared to the quick action of a mulch blower or a Pulvimixer as it works the mulch into the ground with its fast-flying tines.

Though much progress in mechanization has been made, ever-rising road-maintenance costs present further problems and challenges to the roadside development engineers to increase their contribution to lower roadway and roadside maintenance expense.

Roadside Planning Stressed

The 48th Annual Meeting of the American Automobile Association held in New York last October stressed the need for adequate roadside protection in order to end the spread of "roadside blight". Motor-club delegates received booklets on roadside protection measures, and Hugh R. Pomeroy, Director of the Westchester County (N. Y.) Department of Planning, addressed the meeting.

Mr. Pomeroy advocated legislation providing for control of access to main arteries and reasonable and orderly development of the roadsides through highway zoning. The seriousness of the roadside problem, he said, is illustrated by the fact that "even today only 23 states have adequate expressway laws, although such laws should be the bed-rock foundation of any highway modernization program. And not a single state in the Union has yet adopted a statewide highway zoning statute."

Reminding his audience that the roadside problem is not merely one of esthetics, Mr. Pomeroy said that "pro-



Undesirable brush on California roadsides is sprayed with 2,4-D for a permanent kill.

liferating signs of every description, junkyards, ramshackle shanties, and other clutteration along the highway are a part of the problem—but only a part. Actually, the problem is one of preventing accidents, increasing traffic

efficiency, and protecting our highway investment. Recent studies indicate that dollar-for-dollar, more accidents can be prevented by proper roadside control than through improvements in the structure of the roadway itself."

Shoulder Maintenance

A circular describing the Gledhill two-wheel road grader and the shoulder maintainer equipped with a rear strikeoff blade has been prepared by The Gledhill Road Machinery Co., Galion, Ohio. It illustrates both pieces of equipment and lists specifications for both.

The small pull-graders are designed for shoulder maintenance, patrol work, and other light road duties. Mounted on pneumatic tires, they also feature a quick lift of the blade for transporting.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 376.

McDermott With Marion

J. L. McDermott is District Sales Representative for the Marion Power Shovel Co. in eastern Missouri and southwestern Illinois. His headquarters are in the firm's St. Louis district office at 411 N. 7th St.

A STEEL CORD TIRE

- It eliminates blowouts
- It has a high load capacity
- It resists wall bruises
- Its wall are as flexible as those of cotton or rayon tires

It is specially fit for
 rocky roads, excavation work, workyards
 and construction jobs.

Michelin Corp. Tire Div.
 341 East 62nd St. New York 21, N. Y.



**AMONG MEN
WHO KNOW...**

**THE
ELLIS PIPE CUTTER
is BEST
FOR CUTTING
LARGE SIZES
OF PIPE**

No. 01 Cuts Pipe
4" to 8"
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WRITE FOR CIRCULAR AND
PRICE LIST "NO. 33CE" ON
OUR COMPLETE LINE OF
PIPE CUTTING TOOLS.

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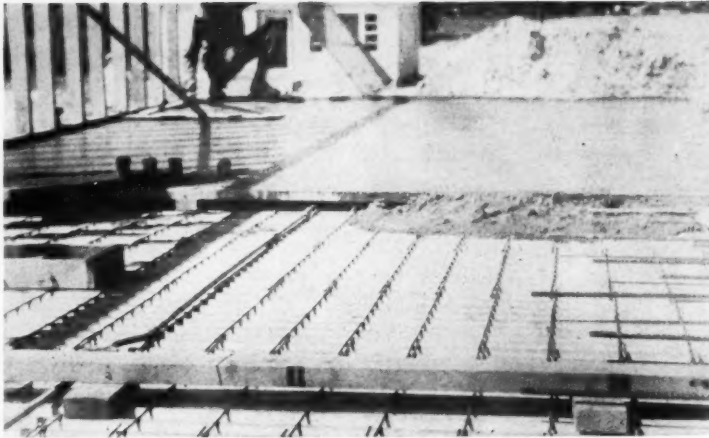
MICHELIN

"METALIC" Y Tire

New System Combines Form and Steel Rods

A patented product in which deep-corrugated high-strength galvanized steel and transverse T-wire reinforcement combine to serve as both permanent form and reinforcement for concrete floors has been developed by Granco Steel Products Co., Granite City, Ill. Cofar, an abbreviation of "combined form and reinforcement", is a new system designed for industrial, commercial, and residential projects, Granco says.

Cofar replaces conventional reinforcing bars and temperature bars at the bottom of the concrete floor slab. Where conventional bars may be required for concentrated loads around openings or for unusual loads, they are tied to the under side of the T-wires at the center of the corrugation valleys. Cofar is pre-cut by the manufacturer to fit the building frame, and is available in large sheets with T-wires welded to them, which are delivered to the job site



Cofar, a combined form and reinforcing for concrete floors, consists of deep-corrugated high-strength galvanized steel and transverse T-wire reinforcement.

ready for placing. The company claims that for normal construction loads, runways, special planking, etc., are not required.

Granco points out that there is no form-stripping job after the concrete has set. The hot-dipped heavy-zinc galvanizing furnishes permanent protection for the under or ceiling side of the floor. The ceilings may be left as they are or finished with a vinyl priming for painting.

Complete description, construction features, design data, tests, and analysis may be obtained from the company by requesting Technical Bulletin No. 501. Or use the Request Card at page 16. Circle No. 288.

Literature on Winches

A folder about a line of winches ranging in capacities from 10,000 to 100,000 pounds has been prepared by Gar Wood Industries, Inc., Wayne Division, Wayne, Mich. These winches, the folder points out, feature full cab control of the jaw clutch, a band-type drum brake, power-takeoff operation, and an automatic safety brake on the wormshaft. They are made in 7 different sizes, 11 models; each is illustrated and brief specifications are provided for each. Other features highlighted in the folder include long-life materials, flexible mounting, automatic safety brake, and ball-bearing wormshaft.

This Bulletin WC-204 may be obtained from the company, or by using the Request Card at page 16. Circle No. 270.

Safety-Equipment Men Meet

At the Industrial Safety Equipment Association October meeting in Chicago, a seven-member board of Trustees was established. Members are Association President C. H. Gallaway, American Optical Co., Southbridge, Mass.; Vice President E. L. Wheeler, Wheeler Protective Apparel, Inc., Chicago; Past President L. E. Dickson, Standard Safety Equipment Co., Chicago; E. H. Brooks, Safety Clothing & Equipment Co., Cleveland; F. R. Davis, Jr., Davis Emergency Equipment Co., Inc., New-

ark, N. J.; S. C. Herbine, Willson Products, Inc., Reading, Pa.; and G. P. St. Clair, Medical Supply Co., Rockford,

Ill. The Glendale Optical Co., Inc., Brooklyn, N. Y., and the Fendall Co., Chicago, Ill., recently joined the Association. The next meeting will be held in Detroit on January 17.

AGC Nominates Horner

Arthur S. Horner, President of the A. S. Horner Construction Co., Denver, Colo., has been nominated for 1951 Vice President of The Associated General Contractors of America. Mr. Horner's nomination follows the death of Gayle G. Armstrong, who was nominated for Vice President by the Governing Board at its regular mid-year meeting.

Mr. Horner has been President of the Colorado Contractors Association, Chairman of the national association's Heavy Construction and Railroad Contractors Division, and a member of the Executive and other committees.

Glenway Maxon, current Vice President, is the association's nominee for 1951 President.

THERE'S AN AMAZING SAVING IN MATERIALS AND LABOR...AND A

Sensational Improvement in your concrete work

WHEN YOU USE THE

WORLD'S FOREMOST "SHAKE-DOWN ARTIST"

Vibration now is recognized as the most efficient and most economical method of placing concrete. It permits use of a materials-saving harsher mix. It results in a most homogeneous distribution, potentially bonded to reinforcing steel and at joints. And it reduces labor costs up to 60%.

But—there is a very real difference in the effectiveness of various types of vibrating equipment. **Vibro-Plus** makes all types.

For general use, the one-man **Vibro-Plus** Rollgear Internal Vibrator is especially practical. Electrically, gas-engine or pneumatic driven, its simple design and super-flexible shaft allow the operator to get in anywhere—around corners, over forms, into tight and confined areas.

Exclusive patented features assure trouble-free operation over long years of service. For example, the **Vibro-Plus** vibratorhead is unique: it never needs lubrication, yet cannot seize-up. Without interruption, this **Vibro-Plus** Vibrator will continue to produce better concrete construction at lowest cost wherever it is used. Write for complete details and name of nearest distributor.

VIBRO-PLUS Internal Vibrator—one of the complete line made by the pioneer in vibrating and compacting.



The **Vibro-Plus** Rollgear Vibrator is available in models delivering from 11,000 to 15,000 vpm. Type MRSB is gas-engine driven. ERSB is electrically operated. Shafts and vibrator tubes are interchangeable.



VIBRO-PLUS PRODUCTS, INC.

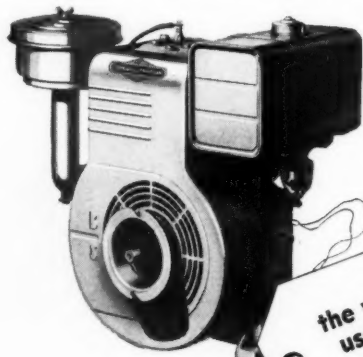
54-11 QUEENS BOULEVARD
WOODSIDE, L. I., NEW YORK

More than
5,000,000



The performance record of more than five million Briggs & Stratton single-cylinder, 4-cycle, air-cooled engines speaks for itself.

BRIGGS & STRATTON CORP., Milwaukee 1, Wis., U.S.A.



"Preferred Power" for home, farm and industrial equipment—powered by gasoline engines.

the world's most widely used single-cylinder gasoline engines

World Wide
FACTORY
SUPERVISED
SERVICE

In the automotive field Briggs & Stratton is the recognized leader and world's largest producer of locks, keys and related equipment.



More power, a hose connection for positive water feed, and pneumatic rear tires are some of the improvements in the Model 250 Di-Met concrete cutter.

New Concrete Cutter Has Increased Power

To insure maximum diamond-wheel life on rugged concrete-cutting operations, Felker Mfg. Co., 1128 Border St., Torrance, Calif., has recently increased the power on its Di-Met heavy-duty concrete cutter. The original 10-hp engine has been replaced by a 13.5-hp air-cooled 2-cylinder 4-cycle Wisconsin Model TF. Variations in wheel speed, regardless of load and depth of cut, are virtually eliminated with this increase in power, the company says. Additional improvements include a hose connection permitting a positive water feed to the blade from external sources. The 15-gallon galvanized-steel tank remains as before for gravity feed.

The improved cutter uses diamond wheels from 8 to 18 inches in diameter and comes equipped with blade guards of two sizes: 14 inches and 18 inches for use on the double-ended spindle. This permits cutting to a 6½-inch maximum depth without extra accessories. The blade is gradually eased into the concrete at a controlled rate of speed by a hydraulic retardant which eliminates sudden shock and possible diamond-wheel damage, Felker says.

To expedite transportation to and from the job, rear tires are now pneumatic, converting the machine to self-trailing. The removable tongue attaches to a standard trailer hitch on car or truck.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 296.

Tractor Improvements

Seat-mounted fuel tanks, with increased capacity to 30 gallons, will become standard equipment for Caterpillar D4 tractors, according to the Caterpillar Tractor Co., Peoria 8, Ill. The current fender-mounted fuel tanks will be offered as optional equipment.

The announcement mentions that several other revisions will be made in the D4 tractors: new, heavy-duty, rigid, plate-type fenders that are free from obstructions to provide more room for installation of attachments; new operating levers and controls for the clutches, gear shift, and brakes; and a new out-of-sight tool box under the seat. The tool box is fabricated as a part of the seat-mounted fuel-tank assembly.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 339.

Structural-Steel Tubing

A new 8-page catalog on welded mechanical and structural-steel tubing is offered by the Tubing Division of Brainard Steel Co., Warren, Ohio. It tells what to expect when you design and build of welded mechanical tubing. It lists applications, describes tubing for construction purposes, and indicates gages, sizes, diameters, and tolerances of tubing produced by Brainard. The

company makes tubing with diameters ranging from ½ inch to 4 inches in ½-inch increments.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 374.

Power Barrow and Cart

An 8-page brochure describing the Bell Prime-Mover, a motorized wheelbarrow and cart, is offered by The Prime-Mover Co., Third and Oak Sts., Muscatine, Iowa. The unit may be used with a 30 x 44-inch steel platform body or a 10-cubic-foot barrow.

Photographs illustrate features of this product, such as its ability to turn in its own length, to pass through doorways, climb a 20 per cent grade, and dump mechanically. Other photos show it performing a number of jobs. Dimensioned drawings and full specifications are included.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 369.

ALABAMA PIPE COMPANY

General Sales Offices

ANNISTON, ALABAMA

Takes pride in announcing the resumption of pressure pipe manufacture at its recently completed modern plant located at Anniston, Alabama. This plant produces Super deLavaud cast iron pipe, centrifugally, in modern long lengths.

Inquiries addressed to our nearest sales offices will be appreciated

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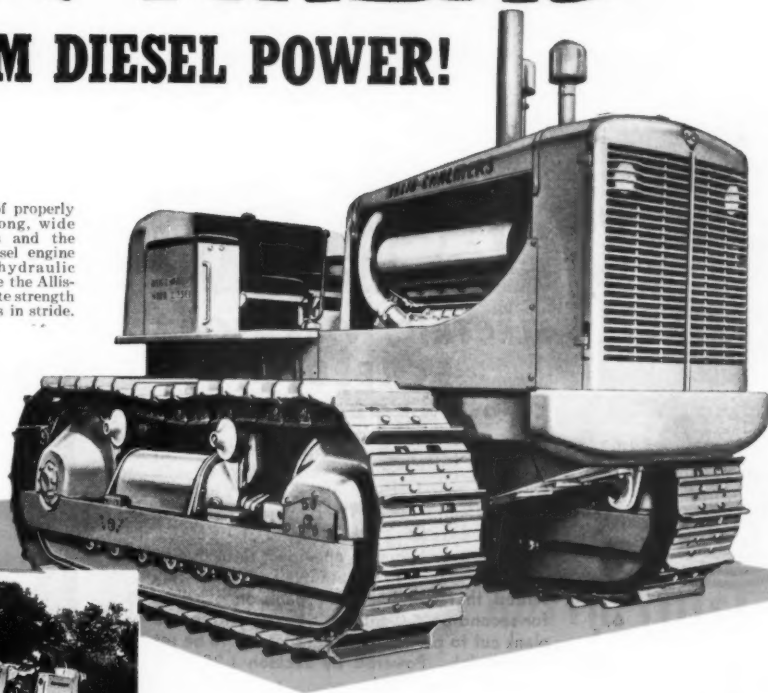
3122 Coleman Road,
Kansas City 2, Mo.

350 5th Ave.,
New York 1, N.Y.

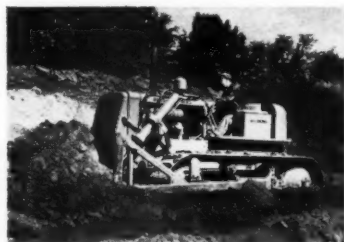
OUT AHEAD

with GM DIESEL POWER!

HD-20—41,800 lbs. of properly balanced weight; long, wide sure-gripping tracks and the new GM 6-110 Diesel engine driving through hydraulic torque converter give the Allis-Chalmers HD-20 brute strength to take toughest jobs in stride.



HD-15—27,500 lbs.—102 Drawbar H.P.—powered by a 6-cylinder GM Series 71 Diesel engine.



HD-9—18,500 lbs.—70 Drawbar H.P.—powered by a 4-cylinder GM Series 71 Diesel engine.

General Motors 2-cycle Diesel engines supply the hard-hitting power that enables Allis-Chalmers' great new line of tractors to outwork all others.

Four and six-cylinder GM Series 71 engines driving the HD-9 and HD-15—and the powerful new GM 6-110 engine driving the HD-20—give these new tractors a reserve of smooth, dependable power for easy handling, increased work and minimum maintenance.

The greater efficiency of 2-cycle operation and direct fuel injection simplifies design and enables these engines to produce far more horsepower than other Diesels of equal size and weight. Interchangeability of Series 71 engine parts provides maximum availability—keeps them on the job.

That's why GM Diesel engines are chosen to power not only the "World's most modern line of crawler tractors"—but more than 500 different kinds of machinery built by 120 manufacturers.

DETROIT DIESEL ENGINE DIVISION

SINGLE ENGINES ... Up to 275 H. P. DETROIT 28, MICHIGAN MULTIPLE UNITS ... Up to 800 H. P.

GENERAL MOTORS

DIESEL BRAVN WITHOUT THE BULK



Hot-Mix Transitions Crowded In by Paver

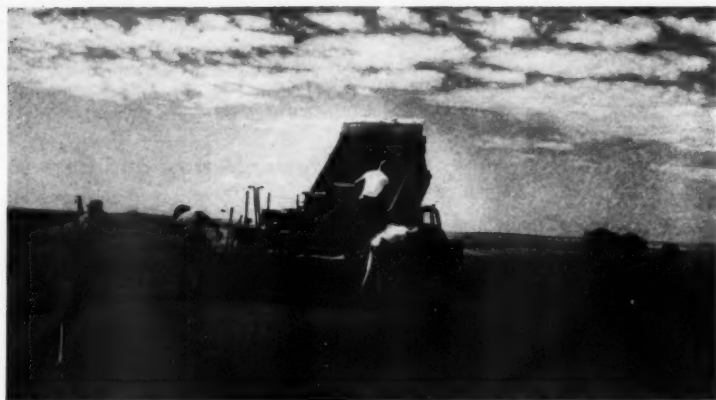
Superelevated Curves and Slivered Courses Laid by
Barber-Greene Finisher on U. S. 10 Improvement

† CROWDING the asphalt-finisher screeds against previously laid pavement, S. Birch & Sons has successfully paved many of the irregular transitions on a 16.6-mile improvement of U. S. 10, east of Dickinson, N. Dak. The machine-laid job was smoother in the transitions than ordinary hand-raked spreading.

The new asphaltic-concrete work is a part of the general improvement of U. S. 10 by the North Dakota Highway Department. The 16.6-mile section was graded, reshaped, and frost-boil-treated

in 1949 under a grading contract by W. H. Noel Co. of Jamestown. When the Great Falls, Mont., highway firm got its \$480,000 contract late in 1949, the sub-grade was largely finished. The Birch contract called for 5 inches of flexible pit-run base, one 2-inch course of asphaltic stabilized base, and a surface course of a 2-inch asphaltic concrete. Prime and seal coats were also included.

The new roadway has 7-foot asphaltic shoulders, for the 40-foot asphaltic base course is centered under a 24-foot asphaltic-concrete top. The 2-inch top



C. & E. M. Photo

A Barber-Greene laydown machine, against a cloudy North Dakota sky, lays hot-mix on U. S. 10 east of Dickinson.

course slopes down on either side in a distance of 12 inches, to allow cars to leave the pavement safely.

Bad autumn weather and previous road commitments prevented Superintendent Larry Mahan and his crew from moving in last year. Mahan arrived in the headquarters town of Dickinson, in western North Dakota, on March 21. He sat in his hotel room all during April, and for 10 days that month watched a blizzard howl in that blocked all traffic on the highway for many hours. It was May 17 before he could set up equipment and order men to work.

Flexible Base Placed First

Granular base material in the Dickinson area of North Dakota is at such a premium that four scattered pits had to be explored to the fullest to get enough gravel to make a 5-inch compacted mat.

Specifications called for 2-inch-minus pit-run material.

The material was screened from a trap through a vibrating scalper screen. Two D8-mounted Caterpillar dozers fed the raw material to the trap. A short conveyor then passed the material to the screen deck. Oversize rock fell off, while the passable material dropped through to a fleet of dump trucks.

A windrow sufficient to make the 5-inch course was dumped on the quarter point. The rock was then blade-mixed by No. 12 Caterpillar motor graders, as water tank trucks moved in with their sprinkler bars going full blast. After the granular base was well mixed, and the particles distributed evenly, the graders cut small segments of the material out and laid the base. As the graders worked, two rubber-tire rollers followed, compacting the base.

(Continued on next page)



1.

The **JACKSON**

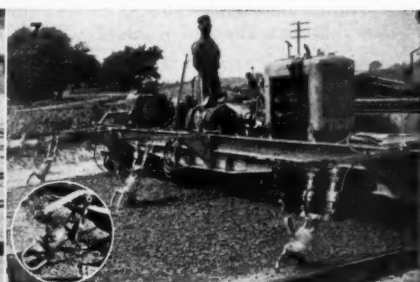
**ELECTRIC, VIBRATORY
SCREED is
FAR FASTER-BETTER!**

It strikes off to any crown, undercuts at curb or sideform, works right up to and around manholes and other obstructions. With it center construction joints may be eliminated and full widths (up to 30') poured. Requires only two men on widest slab, due to strong tendency to propel itself. It's the only screed that can be rolled back on 4 rollers for second pass. Contractor has only to secure plank cut to proper length and crown to be set for any job. Powered by Jackson 1.25 KVA Portable Power Plant.

**IDEAL VIBRATORS FOR
EVERY TYPE OF JOB**

1. Power Plant used with Screed, 1.25 KVA. Others of 2.5 and 5 KVA capacity—all produce both single and 3-phase 110 V., 60 C. AC and have generators requiring no maintenance or adjustment. 2. Hydraulic vibrator with time-saving 50' reach. 3. Powerful, easy to handle electric vibrator—shafts up to 28'. 4. Finest of engine-driven flexible-shaft vibrators. 5. Revolutionary, fast, granular soil vibratory compactor. 6. Heavy-duty mass construction vibrator—a "must" on dams, etc. 7. Sideform vibrator, mounts on finisher, saves better part of 2 men's labor. Write for "Pocket Guide" describing the entire line.

FOR RENT OR SALE AT JACKSON DISTRIBUTORS
ELECTRIC TAMPER & EQUIPMENT CO.
LUDINGTON MICHIGAN



**4940 PILES
DRIVEN
without
a hitch!**

McKiernan-Terry Hammer driving the first concrete pile at the Terminal de Pasajeros in La Guaira, Venezuela. Frederick Snare Corporation, Contractors.



Four McKiernan-Terry Type S-8 Single-Acting Pile Hammers were used to drive 4940 concrete and steel piles on this important project... making a typically perfect McKiernan-Terry record • Three of the hammers drove a total of 4000 18-inch square concrete piles, of 57-ft. average length. A fourth S-8 hammer drove 940 14-inch steel H-piles averaging 53-ft. in length • The report on this job states: "Performance of these hammers was excellent. Piles were driven to 63 tons bearing capacity, no mechanical difficulties were ever experienced with any of the hammers, and no repair parts had to be ordered." • Upon completion of the job, all four McKiernan-Terry Hammers were still in excellent condition • This performance record illustrates why so many contractors choose McKiernan-Terry Pile Hammers for speedy, accurate and economical pile driving. 10 Double-acting hammers, 5 single-acting hammers and 2 extractors are available in the complete McKiernan-Terry line • Write for bulletin giving full data.

McKIERNAN-TERRY CORPORATION, MANUFACTURING ENGINEERS
19 PARK ROW, NEW YORK 7, N.Y. Plants: Harrison, N.J., Dover, N.J.

**McKIERNAN
TERRY**

ME-283

The top of the base was shaped to the 5-inch crown required by the Highway Department, and as much "tight-blading" as possible was done to make the base perfectly smooth. Full-width priming then followed immediately. Warm (170-degree) MC-1 went on, applied by a Roscoe asphalt distributor. The final count showed an average of 0.32 gallon per square yard had been applied. The application of fresh oil did not inconvenience traffic appreciably, and when the prime coat hardened, the Glacier-bound tourists gripped their wheels a little tighter, gritted their teeth, and tried to see if the old bus wouldn't still do 70.

Crusher Comes In

Specifications for the hot-mix mineral were built around a glacial deposit almost halfway in the project. The material had to be crushed and screened to produce about 73 percent passing the No. 4 screen, and 27 per cent retained on the same mesh.

A Cedarapids Master Tandem crusher, with an hourly output of 150 tons in that particular material, was set up. A trap was built to train the pit-run gravel into the crusher. Two D8-mounted dozers fed this trap, and the finished material was transported by conveyor belt directly to a feeder trap at the cold elevator on the asphalt plant.

The rock was unusually abrasive. When the crusher came down, the head mechanic had a spare set of jaws for the primary crusher. He believed that would be enough. Before the job was finished he had used the extra set, and two more besides.

Wear on the roll crushers was stopped by an improved welding process. Square 1/4-inch cast-iron rods were grounded until electricity heated them red-hot. They were then dropped into shallow steel troughs of Wonder Hard surfacing flux, which adhered to the hot iron. The rods were then used in a conventional arc-welding job, and the hard-facing stayed on extremely well.

Asphalt-Plant Setup

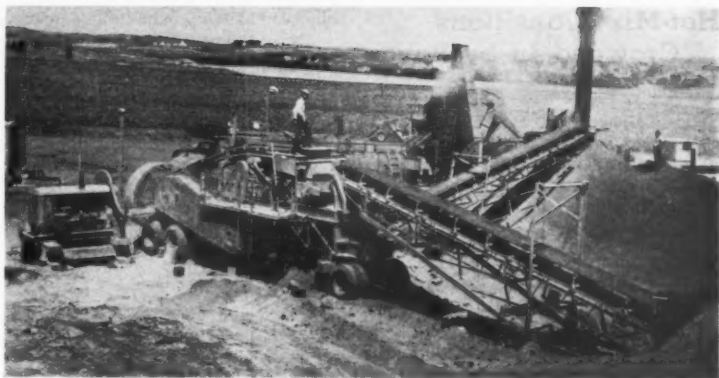
The plant-mix setup for mixing both the asphalt base and the surface course consisted of a Barber-Greene continuous-mix plant. The pugmill had been used with a Barber-Greene loader in 1949 on a Montana travel-plant bituminous project, but the rest of the equipment was all new. Rated at 120

tons an hour, the plant was operated at capacity.

Asphaltic cement was shipped in from a refinery in Laurel, Mont. It was a 120-150 penetration bitumen. It arrived by Northern Pacific freight, was spotted on a siding in Dickinson, and was heated when necessary by a Cleaver-Brooks retort. A 2,500-gallon transfer truck hauled the hot asphaltic cement out to the plant.

At the plant there was one 8,000 and one 10,000-gallon storage tank, insulated by asbestos sheeting and heated by steam coils. Asphalt was unloaded by a 3 1/2-inch Roper pump, and a 700-gallon hot pot on the plant was served by the plant pump.

The plant boiler was a Cleaver-Brooks steam generator, which was efficient enough to run 24 hours—10 at mixing capacity—on only 330 gallons of No. 2 fuel. The boiler was skid-mounted for portability. Before the plant was set up, Superintendent Mahan had a 60-foot well drilled at the site. It furnished the boiler water.



C. & E. M. Photo

Talk about a close-coupled setup! This Birch & Sons Cedarapids crusher discharges right into the cold conveyor of the Barber-Greene asphalt plant.

Steam from the generator heated the asphalt-tank coils, atomized dryer fuel, and heated the pugmill gates.

The mineral filler was separated into a 2-bin pull on the plant's sizing screens. When paving first started, the

material was still wet. The plant has a large single dryer, and progress in the wet mineral was a bit slow at first. When the pit rapidly dried up in hot weather, peak production rapidly was

(Concluded on next page)

SOUTHWEST Compaction Roller



For compacting earth fills!

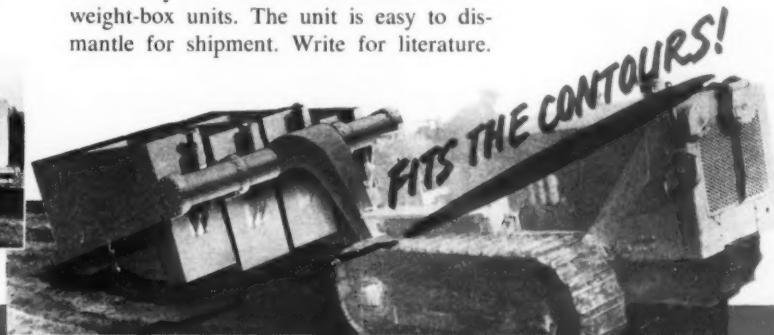
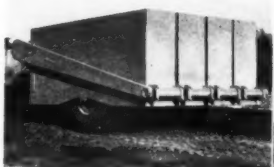
UNEVEN GROUND CONTOURS cannot reduce the efficiency of the new Southwest Compaction Roller. As it travels over the variable surface of the earth fill each weight-box unit with its own wheel and tire oscillates independently up and down. Compaction is positively uniform because the weight on each tire remains constant—there is no bridging and no sudden shifting of load from tire to tire.

The sectionalized tubular yoke permits the use of any combination from three to six weight-box units. The unit is easy to dismantle for shipment. Write for literature.



Note how every print of each tire tread is uniform in depth and shape.

The weight-box units are hinged at the rear and oscillate independently.



DON'T BUY ANY ROTARY MASONRY DRILL

TERMITES get through concrete, masonry, tile faster, quieter... and cheaper!

...until you get the "HOLE" story

That hole in a TERMITE Rotary Drill means there's no "break" in the spiral worm, which was designed to carry off the cuttings and dust. The result... cuttings are carried off quicker to give you faster, more accurate holes. ¶ Get the complete TERMITE story before you buy your rotary masonry drill. Write today.

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CONSTRUCTION MACHINERY DIVISION

Southwest Welding & Manufacturing Co.

Alhambra, California

HAULING SCOOPS BULLDOZERS LOADERS BOTTOM DUMP WAGONS RIPPERS TAMPERS SCRAPERS TREE DOZERS

Hot-Mix Transitions Crowded In by Paver

(Continued from preceding page)

reached.

Mineral aggregates were heated until all the moisture was removed, and they were not heated beyond that point. Asphaltic cement was not burned. The two materials were combined at the lowest possible temperature that would insure a good blend. This temperature was from 235 to 250 degrees.

So-called "asphaltic stabilization" for the base course was really hot-mix. The main difference between it and the surface course was 1 per cent of asphaltic cement. The bottom course was laid with 5 per cent; the top received close to 6 per cent asphaltic cement on account of the predominance of fines in the mix.

Base Course Laid Completely

The paving was laid by starting at the Dickinson end with the base course, and laying one lane as far as a day's run would take the machines. This was ordinarily about 2 miles. The next day another lane was laid along the first, and so on until 2 miles had been finished completely in 4 days. Then the crew started another section of base course, and so on until the base had been laid completely.

In order to break the center-line joint, the base was laid in four lanes as follows: 10.0, 10.5, 9.5, and 10.0 feet. When the machines returned from the east end, bringing the 24-foot surface course, they laid two 12-foot strips, and a special attachment formed the 1-foot slope on the sides.

The laydown machine was a Barber-Greene Finisher. Quickly adjustable, it laid the regular courses without incident. Paving Foreman L. D. Corkran, experienced with plant-mix, made the machine do tricks. On many of the irregular transitions where widened sections went in around curves, he crowded his screeds down on previously laid pavement and trained the hot-mix on the groove of varying width. His experience and skill paid off in a smooth-riding surface.

The mix was such that under normal paving the 8-ton Buffalo-Springfield tandem roller had to stay about 2 hours behind. The joints were eliminated largely by crowding the laydown machine into the previous lane, and the

roller completed a monolithic pavement by giving the center joint the first roll, and extra ones after that.

After the surface course was complete, the pavement was sealed by an application of RC-2 and a seal course of sand. This will provide the necessary resistance to the penetration of moisture, and also give a skid-resistant surface.

Paving which started June 26 was expected to be finished 2 months later, with final completion of all items slated for September 10.

Relations between contractor and engineering department were such that a decidedly pleasant atmosphere was apparent. In fact, Superintendent Mahan urged that "Something should be said about the businesslike approach, and the competent engineers of the North Dakota Highway Department."

Construction problems were handled quickly at the field level. There was an absolute minimum of inspectors, but there were enough to cover all operations thoroughly. There was no excess

baggage. The contractor was given all the latitude possible to operate his new equipment profitably, and the State Highway Department was getting a good job. Everybody was happy.

"I've paved a lot of jobs," Mahan said in summing it up. "When the weather let us get started on this one, it was the best by far I've ever been on."

Chief Engineer M. P. Wynkoop, under whose supervision the project was done, made a personal inspection when the paving was about half finished. He drove on through, satisfied.

Albert Birch, Vice President of S. Birch & Sons, headed field work whenever possible. Larry Mahan was in general charge, with L. D. Corkran as Paving Foreman, William Ille at the hot plant, Les Miller on the crusher, and Homer Haney in charge of the office.

Maginniss Sales Branch

Maginniss Power Tool Co., Mansfield, Ohio, has a new branch at 6900 San Fernando Road, Glendale 1, Calif., with

William N. Sundahl in charge, as direct factory representative for 11 western states. A stock of tools and parts is maintained at the new location to facilitate prompt shipment and service.

Maginniss products include concrete vibrators, portable saws and grinders, and electric generators.

Single-Drum Hoists

The new 16-page Bulletin 76-X released by Joy Mfg. Co., Oliver Bldg., Pittsburgh, Pa., describes the complete line of Joy single-drum multipurpose hoists for mines, construction jobs, oil fields, and industrial plants. It contains complete descriptions and specifications for hoists with capacities from 500 to 3,500 pounds. These hoists are driven by Turbinair, Pistonair, electric, or gasoline engines. A handy Select-O-Hoist chart simplifies the choice of hoist to fill a particular need.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 305.

FOR SOIL COMPACTION WHERE ROLLERS CAN'T GO!

The Barco Pegson Rammer



This self-contained, portable rammer is specially adaptable to tamping close to abutments and other wall structures, in narrow ditches and trenches, thus eliminating troublesome settlement areas. Actual field tests, certified by Government agencies, have proved that one man using

the Barco can do the work of five who use conventional equipment! This economical machine is easy to operate—no lifting, no strain, no vibration. A slight tilt on the handle will "walk" the Barco wherever you want it to go. Don't tie up your funds in heavy equipment—order Barco today. Write for free demonstration or catalog to Barco Manufacturing Co., 1818B Winnemac Avenue, Chicago 40, Ill.



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Operating the Gre-Zer-Ator portable lubricating gun is as easy as shaking hands, says its manufacturer. It is used with the original oil container.

New Lubricating Gun Uses Original Pails

A one-hand high-pressure grease gun is the way National Sales, Inc., 812 N. Main St., Wichita, Kans., describes its heavy-duty Gre-Zer-Ator, a portable lubricating gun using 25 or 40-pound pails. One stroke of the hand lever, the company says, will dispense lithium, barium, or heavy soda-base greases in coldest weather. The 10-foot hose, with a swivel connection to prevent kinking, is designed to make all fittings easily accessible.

Special features of the Gre-Zer-Ator include continuous flow of lubricant by spring pressure; simple assembly without tools; a 2-piece steel pressure booster, easy to clean and repair; and quality-steel construction.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 347.

New Line of Steels With Cold Toughness

The first of a new group of alloy steels to be known as T-steels has been announced by Carnegie-Illinois Steel Corp., 434 Fifth Ave., Pittsburgh, Pa. Carilloy T1 is a multiple-alloy plate steel, which combines extremely high strength with excellent ductility and toughness, even at subzero temperatures, the company says.

With almost double the strength of high-strength low-alloy steels, and almost triple that of ordinary welding-grade structural steels, Carilloy T1 promises to effect considerable savings in applications calling for heavy steel members of 1/2-inch thickness and up, according to Carnegie-Illinois. It is designed to be at least two to three times as resistant to atmospheric corrosion as plain carbon steels.

This plate steel is furnished heat-treated to a minimum yield strength of 100,000 psi. It maintains adequate toughness even at this high level of strength and is suitable for application where extreme high strength and good weldability are required. Welding does not adversely affect the properties of this steel, which has been designed to require no special preheating or post-heating treatments in welding or gas-cutting operations beyond those normally used with ordinary structural steels. If low-hydrogen-type electrodes are used, Carilloy T1 is not susceptible to under-bead cracking. Electrodes that will develop the full strength of the T1 basic metal are available and should be used if 100 per cent joint efficiency is needed.

No special equipment and procedures are required for fabrication. Bending or forming may be accomplished cold if sufficient power is available to over-

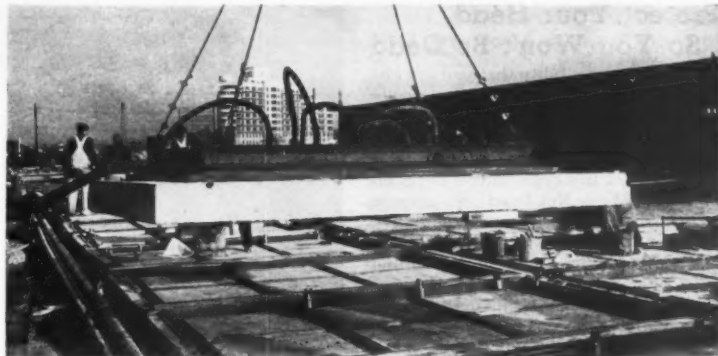
come the high yield strength. If hot forming is necessary, the operation must be followed by heat treatment which involves liquid quenching and tempering after the hot-forming operation. Corporation metallurgists will give the user the necessary heat-treatment information for this work.

The unique properties of this new steel are obtained by blending multiple alloying elements, coupled with precision heat treatment. Carbon content is restricted to 0.18 maximum to promote ease of welding and gas cutting.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 274.

Ponkey With Ideco

C. Edwin Ponkey is now General Manager of the Columbus, Ohio, Division of International Derrick & Equipment Co. He succeeds Ferguson Barnes who recently resigned. Mr. Ponkey was formerly Vice President of the Sheldrick Mfg. Corp.



The Vacuum Concrete Lifter removes slabs when only twelve hours old.

Vacuum Concrete Precasting Doubles Speed of Construction. Write for information and literature.

Vacuum Concrete, Inc.,

4210 Sansom Street,
Philadelphia 4, Penna.



"hour after hour . . . without shutdowns"

... that's what **Byson Harvey, Superintendent of George J. Shaw Hauling Co., Kansas City, Mo.,** wants and gets with **STANOLUBE HD Motor Oil.**

Nothing needs to be added to Mr. Harvey's story of his experience with STANOLUBE HD. He writes:

"We are writing to tell you what a completely satisfactory job STANOLUBE HD is doing in our diesel equipment.

"In the ten pieces of dirt-moving equipment that we have in daily use, inspection shows a complete absence of ring sticking, varnish, deposits in ring lands, or corrosion; in fact, STANOLUBE HD does just about as good a job as an oil can do.

"In our work, it's the hour-after-hour operation of the equipment without shutdowns that makes for good results, and we never have shut down because of oil failure with STANOLUBE HD."

If your equipment operates under adverse conditions, or if you think engine overhauls are required too frequently, try STANOLUBE HD.

STANOLUBE HD
REG. U. S. PAT. OFF.
Motor Oil

The advantages offered you by STANOLUBE HD go hand in hand with the benefits of an automotive engineering service that's unique in the Midwest. The Standard Oil Company has located practically at your doorstep a specially trained and experienced lubrication specialist. This man will give you "on-the-spot" engineering service that's vital to fleet operations. His headquarters are the nearest Standard Oil Company (Indiana) office. You can obtain his assistance by contacting that office or writing: Standard Oil Company (Indiana), 910 South Michigan Avenue, Chicago 80, Illinois.

STANDARD OIL COMPANY (INDIANA)



Protect Your Head So You Won't Be Dead

There is a possibility that you are eligible for membership in the newly formed Turtle Club, a nonprofit non-commercial association of men who have had their lives saved by hard hats. The motto of this organization is "Shell on Head—We're Not Dead". Its purpose is to lend the prestige and cumulative experience of the total membership to each individual member in promoting more widespread acceptance and use of head protection. It is the privilege of each member to wear a turtle lapel pin and a turtle sticker for his hard hat.

The accompanying photo shows the first Turtle Club member to be registered in the United States, David J. Jones, Inspector for the U.S. Bureau of Reclamation on the Riverton Project in Wyoming. Jones became eligible for membership when he was struck by a 200-pound rock slab. His hard hat, according to witnesses, saved his life—he incurred nothing more than a fractured hat and a good shaking.

Are you eligible? Is there someone on your job who is eligible? Turtle Club membership is free to all successful applicants. Copies of the constitution and membership application blanks are available without charge from E. W. Bullard, 275 Eighth St., San Francisco 3, Calif. Or use the Request Card at page 16. Circle No. 364.

Broadside on Earth Movers

A new bulletin describing the Series 800 Heiliner high-speed scraper and bottom-dump wagon has been offered by The Heil Co., Milwaukee 1, Wis. Featured in this large-sized catalog are job pictures, cutaway drawings and photographs, and complete specifications of the Heiliner with its interchangeable scraper and bottom-dump wagon.

The bulletin presents information on the Heil patented Hydro-Steer and Super Axle, and on the Cummins 200-hp diesel engine which powers the unit. Forty refinements of the Heiliner are also illustrated in a double-page cut-away drawing. The literature includes operational drawings, complete specifications, and photos of the unit in the field.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 378.



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you're right if you
specify

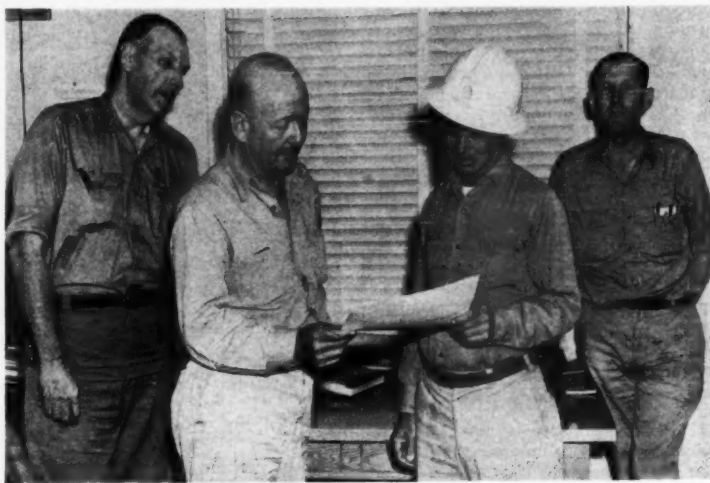
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Drafting Instruments*
SINCE 1819

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Instruments have proved
their superiority on
the firing line of service
for generations. Made
with meticulous care
from the finest materials,
and incredibly accurate, Kern Draft-
ing instruments are the first choice
of professionals, instructors
and students the world
over. You can be sure you're
right if you specify KERN.

A wide selection of
models at attractive
prices. Write for
particulars, Dept. CE.

BORDEN & RILEY PAPER COMPANY, INC.
60 East 11th Street New York 3, N. Y.



Wearing the hard hat that saved his life, David L. Jones, USBR Inspector on the Riverton Project in Wyoming, receives his certificate as first U.S. member of the Turtle Club. Project Engineer T. A. Clark makes the presentation while Safety Engineers Miller Prose (left) and V. P. Vogt witness the ceremony. The Turtle Club is an organization of men whose lives have been saved by a hard hat.

Catalog on Sling Chains

A new 32-page catalog on ACCO registered sling chains has been prepared by American Chain & Cable Co., Inc., American Chain Division, Bridgeport 2, Conn. It provides complete specifications and describes the quality as well as the dimensions and material sizes of all the company's products. It includes charts for determining capacities at various working angles with different sling assemblies, and it offers recommendations for the care and inspection of sling chains.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 262.

Mack Names Brady

W. A. Brady was recently named Manager of the Bronx branch of Mack-International Motor Truck Corp. He has been with Mack since 1936, and prior to his promotion was Assistant District Manager of the New York City branch.

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Ford Builds Foundry And an Engine Plant

Bell-Type Caisson Foundations Constructed Economically. And Quickly With Earth Augers and Transit-Mix Concrete

(Photo on page 1)

THE Ford Motor Co. is constructing at Cleveland, Ohio, a new foundry and engine plant for the manufacture of Ford 6 and 8-cylinder gasoline engines. The foundry will cast the parts which will be machined, assembled, and tested in the engine plant. About 8,000 will be employed at this mammoth manufacturing center which is scheduled to be in production by May, 1952. Construction got under way in May, 1950.

Great strides were made in the building progress with the use of bell-type caissons for the greater portion of the foundation. Shafts with bell-shaped bottoms were cut into the firm soil by earth augers. These excavations were then filled with plain concrete to form the caissons. With this type of foundation, no forms, reinforcing steel, or backfilling was required, thus eliminating three construction operations that are of necessity slow-moving and costly.

The 209-acre site for the plant is in Brook Park Village across the city line at the west boundary of Cleveland, and close by the Cleveland Airport. It fronts to the north on Brook Park Road, with relocated Engle Road running along the east property line. Along the west side are the main-line tracks of the New York Central Railroad from which seven leads come in to the foundry and two to the engine plant. Besides the foundry and engine plant, the layout will include a boiler house and personnel building.

Clay Soil

The site was typical northern Ohio farming land, with its deep clay soil presenting a fairly flat surface. About 150,000 cubic yards of dirt was moved in attaining the proper grade, of which about one-third was borrow material obtained from the south end of the plot. Grading was done with three tractor-scraper units which stockpiled the topsoil for use later in landscaping the grounds. The borrow dirt was excavated by a shovel and hauled by bottom-dump Euclids. Fills were built up in 6 to 8-inch lifts, and compacted by sheepsfoot rollers.

Work got started on the engine plant first, after the Dearborn, Mich., headquarters of the Ford Motor Co. awarded a contract to Hunkin-Conkey Construction Co. of Cleveland to build the substructure, including excavation, foundation, sewer and track work, as well as the structural slab for the building. Bethlehem Steel Co. is furnishing and erecting the structural-steel framework, while H. K. Ferguson Co. of Cleveland has the superstructure contract for building everything in the engine plant above the first-floor level.

The engine plant, which is at the front or north end of the site, is a single-story structure 905 feet square. At the front end is a two-story office wing 400 feet long x 40 feet wide, while a train shed is at the rear of the building. One track enters the plant at the rear, and runs along the east wall in a depressed section to the north end.

Steam heat for the buildings will be furnished by a boiler house, connected to the engine plant by a reinforced-concrete service tunnel 7 feet square x 1,400 feet long. Water for the plant is tapped from Cleveland mains, and the city sanitary sewers also service the site. A storm sewer, 2,000 feet long, has been built across the plot. With

its laterals, this line drains the entire area into an open field on the north side of Brook Park Road. The sewer consists of a concrete slab base supporting a corrugated-metal arch roof that enlarges in size from a single 9-foot-diameter line at the upper end, to twin 11-foot arches at the outlet. Both Armco and Republic Steel sections were used in the construction of the storm sewer.

Bell-Type Caissons

The engine plant is supported on a

foundation of 575 bell-type caissons—neat excavations in the ground that are filled with plain concrete. The shafts are mostly 3 feet in diameter, with a few going to 4 feet, and average 7 to 8 feet in depth. At the bottom they are belled out to diameters varying from 5 up to 12 feet. Holes were dug easily and quickly with Jaques earth-boring machines, an auger-like power tool mounted at the rear of a truck. First

the shafts were drilled to the bottom depth required, then the bellying attachment enlarged the base so that the sides up to the shaft assumed a 2 to 1 slope. Dirt was removed from the hole as the auger was lifted out.

In the firm clay soil this method of excavation and type of foundation worked to good advantage. No forms were required below ground level, and

(Continued on next page)

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Ford Builds Foundry And an Engine Plant

(Continued from preceding page)

where the top of foundation grade was higher than the surface, the shafts were extended upward with the use of metal forms. The large base area provided also eliminated the need of reinforcing to strengthen the concrete. On top the shafts are squared off, with steel base plates set in grout pads for the building columns.

Transit-mix concrete for the project is furnished by Goff Kirby Ready Mixed Concrete and the Clifton Coal & Supply Co. The two companies went in together on the deal since neither alone could supply the big job and still handle its other commitments in the area. Both use the same batch plant which was recently erected on Brook Park Road just across from the Ford site. As many as 15 truck mixers haul and mix the concrete. On this foundation work the material was chuted di-



C. & E. M. Photo
A Jaques earth-boring machine digs holes for the bell-type caissons for the Ford engine-plant foundation.



C. & E. M. Photo
A Jaeger truck mixer delivers concrete to a foundation pour for the depressed track to be laid in the engine plant.

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rectly into the ground or forms. Constant vibrating insured the concrete spreading out to the sidewalls of the bell bottoms.

All the caissons at the engine-plant location were drilled by two Jaques units. These two machines opened up an average of 40 holes—having typical 3-foot shafts belled out to 6-foot bases—in an 8-hour day. By August 8, 1950, the caissons for the engine plant were completed.

Steel Framework

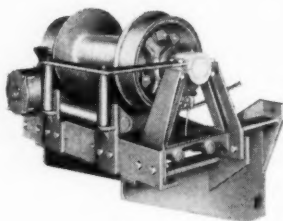
A grade beam, or foundation wall, of reinforced concrete goes around the perimeter of the building. This wall is

12 1/2 inches wide, and has a depth of 4 1/2 feet below the finished grade. It too was poured neat in the ground with transit-mix concrete, and required no forms. The bed for the depressed track in the plant is reinforced concrete 10 feet wide x 10 inches thick, on which steel ties are laid to receive the rails.

By July 25 enough steel had arrived from its Pittsburgh plant to permit the Bethlehem Steel Co. to begin erecting the structural framework. Members arrived by rail at the plant siding where they were unloaded by crane and hauled by truck to their designated location. Four cranes were employed—

(Continued on next page)

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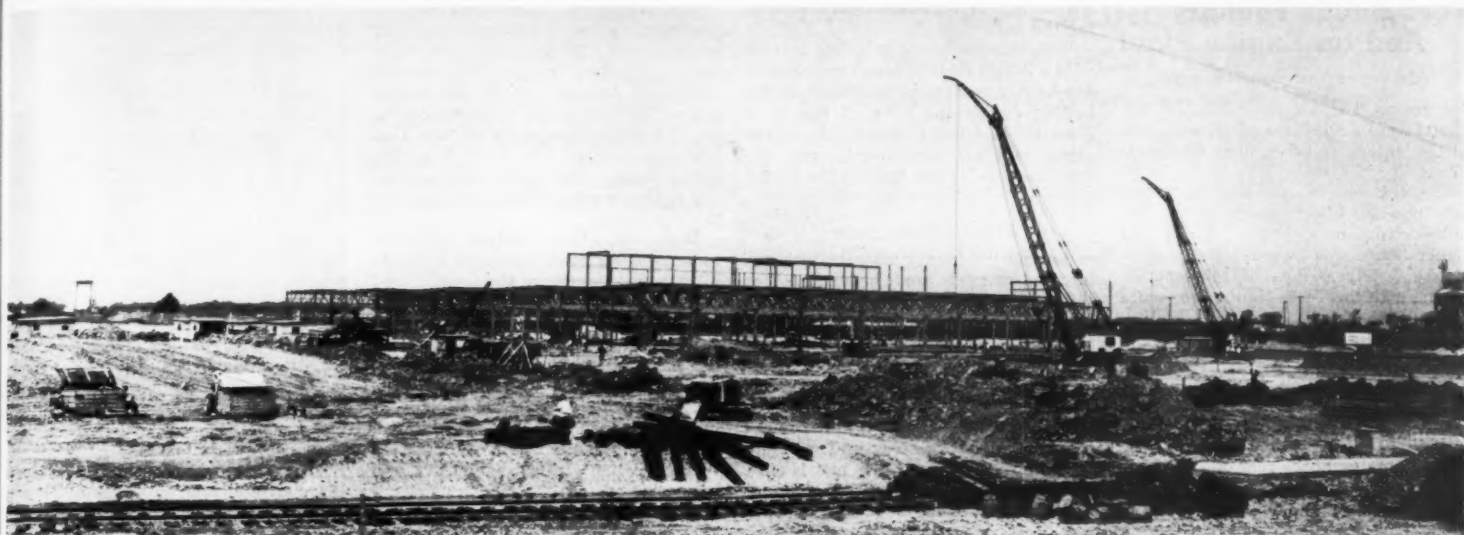


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C. & E. M. Photo

This general view shows steel work going up for the Ford engine plant, along the south end.

one for unloading and three for erecting—all equipped with 80-foot booms and 20-foot jibs. Columns are mostly 12-inch H-beams, 16 feet high, erected to form 40 x 50-foot bays. They support trusses in both directions, with depths from 7 to 8 feet. The building is riveted throughout.

As the steel goes up, the 8-inch reinforced-concrete floor slab will be laid in 20-foot lanes, following procedures usually associated with highway work. The structural slab will be covered with 2½ inches of plain fill concrete which will contain conduits for service-line distribution. In most of the work areas the floor will be surfaced with 2½-inch wood block or brick. The aisles will be traprock concrete.

Modern Plant

From the finished floor elevation of 789.0, walls of face brick backed up with Natco unglazed speed tile go up 9 feet around the outside of the building to sill height. Windows 12 feet high encircle the structure, and above them is metal siding extending 4½ feet to the roof line. The roof is a metal deck furnished in sheets that are tack-welded to the purlins. The metal is covered with a 1½-inch course of insulation, and then topped by a 20-year bonded roofing material. Besides the ample windows, the plant has an overhead system of electric lighting.

The engine plant is expected to be completed by the summer of this year. It will have 835,000 square feet of floor area, and will contain 35,000 cubic yards of concrete; 6,200 tons of structural steel; 1,000 tons of reinforcing steel; and 361,000 light-color face brick.

The Foundry

One of the unexpected problems encountered in the construction at the site was the presence of several deep natural-gas wells. They extended from 1,500 to 2,500 feet down through the limestone strata that lay beneath the clay soil. Most of these wells are at the rear of the plot where the foundry is located. The wells were never exploited commercially, but farmers living in that area had been tapping them

(Concluded on next page)

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Ford Builds Foundry And an Engine Plant

(Continued from preceding page)

for years. To plug the wells, 10-inch shafts were drilled, sealed off with lead at the bottom, and then filled with concrete.

Construction on the foundry began on June 20, after a contract for the substructure of both the foundry and boiler house was awarded to Johnson, Drake & Piper, Inc., of Minneapolis, Minn., with the Terre Haute, Ind., office directing the work. Structural steel for the foundry is being furnished and erected by the Bethlehem Steel Co. Boiler-house steel is supplied by the Ingalls Iron Works of Birmingham, Ala., and erected by the Steel Construction Co. of Verona, Pa.

The foundry, at the rear of the engine plant, is 1,390 feet long, with a depth of 660 feet on one side and 540 feet on the other. An office wing projects from the long side. The floor area in the foundry totals 1,025,900 square feet. Between the foundry and engine plant is a parking lot, while just west of the foundry is a 160 x 150-foot boiler house with 24,000 square feet of floor area.

Contracts have been awarded to Johnson, Drake & Piper for the superstructure of the boiler house and to H. K. Ferguson Co. for the superstructure of the foundry. R. H. Hansen Co. of Cleveland has the general contract for the personnel building, with Bethlehem Steel fabricating and erecting the structural steel; however, no work has been started on these contracts.

Heavy Foundation

Large molding machines, core ovens, cupolas, etc., will be housed in the foundry, requiring heavy foundation for support. Both bell-type caissons, 700 in number, and 400 spread footings are used. The spread footings are of various sizes up to 16 feet square; these have a depth of 15 inches. The caissons also vary in size, with the shafts usually between 3 and 4½ feet in diameter, and with the bottoms belled out from 4 feet 8 inches to 15 feet in diameter. The excavation was done both by the Jaques auger equipment, and by a Gar Wood earth-boring machine.

The Gar Wood unit is a digging bucket that comes in various sizes to suit the dimensions of the hole required. To cut a 3-foot hole, for instance, a 3-foot-diameter digging bucket is used with flaps on the bottom that open to cut a bell up to 6½ feet in diameter. The cylindrical steel bucket is 10 feet 6 inches deep. The earth borer is mounted on a Buckeye Clipper crane equipped with a 50-foot boom from which the shaft of the unit is hung. A special-built arm off the crane at the base of the boom supports the bottom of the shaft, which is a 6-inch steel pipe built up to a square cross section; it is 34 feet long. The boring action works off the crowd on the crane, while hydraulic pumps open the cutting flaps at

the bottom of the bucket for excavating the bell.

With this machine a bell-type caisson with a 3-foot shaft 10 feet 6 inches deep can be dug in 20 minutes, including the belling out of the lower 2 feet to a diameter of 4 feet 8 inches. As in the other building, transit-mix concrete was poured in the holes. No forms, reinforcing, or backfilling was required.

Exterior Construction

Around the foundry is a 12-inch reinforced-concrete grade beam, 12 inches thick and from 3½ to 4 feet deep. Piers on top of the caissons support the steel columns. The working floor level is at elevation 789.0, but there are also various levels for basements, pits, sumps, etc. A sand bin with 54,000-ton capacity, for instance, is built into the foundry. The average structural concrete floor slab is 8 inches thick, and is covered with 2½-inch wood-block and brick paving, except for the traffic aisles which will be made of monolithic wear-resisting materials.

The foundry is higher than the engine plant, being 77 feet in the monitor section, with a 68-foot clearance to the bottom of the trusses. The outside walls are concrete up to sill height. Above the 8-foot sash windows, corrugated siding extends up to the roof which is cement tile from 2 to 3½ inches thick. The joints between the tile slabs are poured with asphalt mastic.

Major quantities include approximately 46,000 cubic yards of concrete in the substructures of the foundry and boiler house; and 15,000 tons of structural steel. A network of concrete roads will eventually service the various parts of the big plant. Once production gets under way at the Cleveland site, the River Rouge plant at Dearborn, Mich., will be rehabilitated, with the ultimate purpose of increasing the production of Ford engines.

Personnel

The new plant was designed by Ford Motor Co.'s engineers in conjunction

with F. A. Fairbrother and George H. Miehl, engineers and architects and Albert Kahn Associates, all of Detroit, Mich.

Supervisory personnel for the contractors include Bob Price, Superintendent for Hunkin-Conkey Construction Co.; Larry Dean, Superintendent for H. K. Ferguson Co.; C. A. Nelson, Superintendent for Johnson, Drake & Piper, Inc.; and "Hollerin" Harry Hiscott, Superintendent for the Bethlehem Steel Co. At the peak of construction a force averaging 500 was employed on all contracts.

The entire project is under the supervision of J. A. MacAlarney, Director, Plant Engineering Office, Ford Motor Co., Dearborn, Mich. P. B. Allen is Project Engineer on the motor plant and Kenneth B. Lockhart is Resident Engineer at the site. F. C. Riecks is the Project Engineer and J. F. Hangs is the Resident Engineer on the foundry and boiler house. J. H. Gilroy is representative of the architect at the site of the job.



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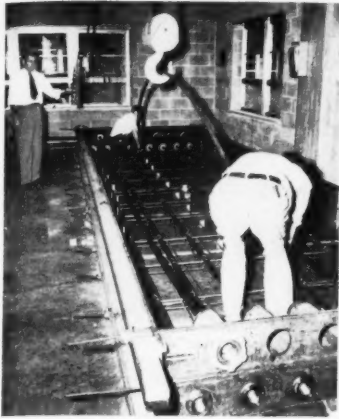
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Fifteen bridge strands, composed of 37 5-mm high-tensile-strength steel wires encased in a plastic tubing, were used in construction of the prestressed-concrete railroad trestle slab tested to failure at the Portland Cement Association's laboratories. The method of securing the strand sockets in the end plate can be seen at lower right. Strands were post-tensioned to 120,000 psi.

Prestressed Concrete For Railroad Trestle

Interesting tests of a prestressed-concrete railroad trestle slab approximately one-half the depth of a conventional reinforced-concrete slab of the same length and width were made recently. The prestressed slab was loaded to failure at the Portland Cement Association's new Research and Development Laboratories near Chicago last September and withstood a load of 2½ times the design load.

In the tests a full-size slab 25 feet long, 7 feet wide, and 1 foot 6 inches deep, designed for a Cooper E-72 live load plus full impact, withstood a load of 480,000 pounds before failure. This was equal to approximately 2.8 times live load and impact.

The trestle slab was built at the PCA laboratories in cooperation with the Association of American Railroads and John A. Roebling's Sons Co. It weighed 20 tons and contained 10 cubic yards of concrete designed for a strength of 7,000 psi at 28 days. Prestressing was done with 15 bridge strands 1¾ inches in diameter, post-tensioned to 120,000 psi by two hydraulic jacks. Eight of the strands were positioned straight along the bottom of the slab. The remaining seven were slung in parabolic form rising at the ends, thereby reducing the vertical shear, a feature of post-tensioning. A plastic casing was used to prevent bond with the concrete.

Over 150 visitors witnessed the tests, representing members of the Masonry Committee of the American Railway Engineering Association, the American Railway Bridge and Building Association, the Bureau of Public Roads, and many state highway departments.

A full report was not immediately available, pending more detailed analysis of strain-gage readings, deflection, and other data obtained during the tests. But the loading demonstration seemed to more than substantiate the belief of the engineers present that prestressed reinforced concrete will soon find wide application in this country.

The tests were doubly interesting to the engineers because up to the start of construction of the Walnut Lane Bridge in Philadelphia (see C. & E. M., December, 1949, pg. 52) late in 1949, the use of prestressed concrete had been confined almost entirely to western European countries.

Before the demonstration, brief talks were made on prestressed concrete, the prestressing strands and end connections, equipment for measuring strains in concrete and reinforcement, and the design and construction of the slab. The tests were then carried out in several steps.

A strand and socket connection was tested in the Association's 400,000-

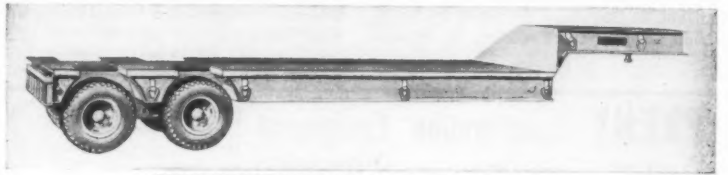
pound-capacity testing machine. A tensile force of 255,000 pounds or 228,000 psi was required to break the strand, which was composed of 37 5-mm high-tensile-strength steel wires encased in a plastic tubing. At the test load there was no evidence of failure of the end connections.

The prestressed slab was loaded to full design load in the 1,000,000-pound-capacity compression testing machine. The load was then increased until the first hairline crack appeared at approximately 1½ times live load and impact. Upon removal of the load the crack disappeared entirely, indicating the complete elasticity of the slab. Finally the slab was loaded until failure occurred in the upper portion at approximately 2.8 times the live load plus impact.

Each time the load was increased, the 100-odd strain gages located throughout the slab were read at the central "switchboard" especially developed for the tests. Deflections of the slab were also noted.

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type of equipment on the job. Of the eighteen tandems employed, twelve were Buffalo-Springfields. This heavy Buffalo-Springfield preference is best expressed in the words of Mr. Pierce Flanigan:

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☐ Notify Distributor to call.

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THE STANDARD OF COMPACTED
BUFFALO SPRINGFIELD
SPRINGFIELD, OHIO

Anti-Abrasion Compound Conserves Rubber Belts

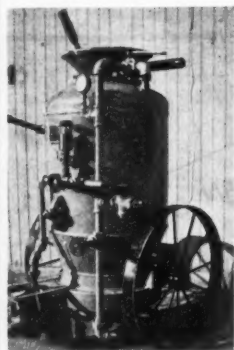
A complete line of anti-abrasion plastic rubber compounds for protecting and repairing worn conveyor belts is described in literature prepared by Magic Chemical Co., 121 Crescent St., Brock-

ton 2, Mass. The Magic-Vulc plastic rubber and primer are applied to belt areas which are worn or damaged, showing exposed duck carcass. Any unskilled workman can apply the materials, the catalog says, and the same materials can be used to seal edges and rivet holes.

PREHY Construction Equipment (Weber system)

The Prehy Grouter and Placer is the new indispensable equipment for:

- Plastic and fluid pressure grouting
- R. R. track or ballast grouting
- Soil stabilization
- Correction of structural deficiencies, sinking foundations, floors, etc.
- Conveying and placing insulating materials such as Parete.



Prehy Concrete Gun

The Prehy Concrete Gun is efficiently designed for the application of GUNCON (gun applied concrete). It is particularly useful for building all types of masonry structures, including reservoirs, tunnels, bridges and bomb shelters. It is also widely used for repairing deteriorated or spalled concrete, fire-proofing, etc., as well as dry and wet sand-blasting.

Write for literature on both machines

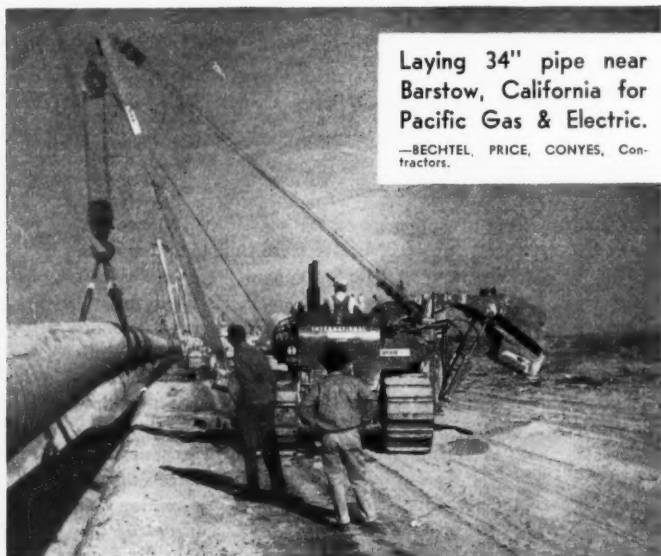
THE PREHY CO., Inc., 420 Lexington Avenue, New York 17, N. Y.



Prehy Grouter

Takes real muscle...

... PLUS MUSCLE CONTROL



Laying 34" pipe near
Barstow, California for
Pacific Gas & Electric.

—BECHTEL, PRICE, CONYES, Contractors.

As far as the eye can see this huge 34" pipe is being gently cradled by a fleet of Superior PBI-24C Pipebooms, powered by International Diesels. Clear visibility, sensitive and positive control, extendable counterweights and "muscle" to lift 90,000 pounds, all these contribute to the superb performance of Superior Equipment.

OTHER SUPERIOR EQUIPMENT: BUCKET BACKFILLERS, BLADE BACKFILLERS, ANGLE PUSH BLADES, PIPE-TONGS, DOLLIES AND BLOCKS. SEND FOR COMPLETE INFORMATION!

Superior EQUIPMENT CO.

BUCYRUS, OHIO

This treatment has been shown to give belts increased resistance to abrasion and to eliminate shrinkage and decay due to moisture seepage, the company reports. Magic-Vulc may be used also to coat valves, pipes, and fittings, and to line chutes.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 371.

Tractor Attachments

Three new heavy-duty attachments for the new Allis-Chalmers HD-9, HD-15, and HD-20 tractors, in both hydraulic and cable-controlled models, have been announced by The Baker Mfg. Co., Springfield, Ill. Principal design feature of the new bulldozers, Gradebuilders, and root rippers is the "fingertip control" achieved through the short linkage between the blade control lever and hydraulic control valve. The reduced number of working and wearing parts in the short hydraulic linkage enables the operator to feel the changes in blade position and maintain full positive control with greater ease, according to the company. Direct lift, positive down-pressure, and positive hydraulic "hold" have been retained in the new hydraulic models.

Other units manufactured by Baker for use with the new A-C tractors are sheepfoot tamping rollers, heavy-duty road rippers, and power-control units.

Complete specifications on all Baker attachments are available from Baker-Allis-Chalmers dealers or direct from The Baker Mfg. Co. You may also use the Request Card bound in at page 16. Circle No. 322.

Flare Nut Wrenches

Two new flare nut wrenches, a $\frac{3}{4}$ to $\frac{1}{2}$ -inch and a 1 to $\frac{1}{2}$ -inch, have been announced by the Owatonna Tool Co., 381 N. Cedar St., Owatonna, Minn. They are designed for fuel, hydraulic, and other liquid lines on diesel equipment.

The wrenches are made with hex openings to provide bite and to prevent turning the corners on soft brass nuts usually found on copper lines. They are drop-forged from alloy steel and are fully heat-treated with a chrome-plated finish.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 341.



The new Sherman power digger takes ditch and trench digging in stride. Here it cuts an 8-foot-deep trench in clay.

A Hydraulic Digger

An improved hydraulically controlled excavating machine with a 3.5-cubic-foot capacity has been announced by Sherman Products, Inc., 3200 W. 14 Mile Road, Royal Oak, Mich. It will work behind any wheel tractor, with the independently mounted hydraulic pump operated from the power-takeoff shaft of the tractor. All digging motions are hydraulically controlled.

The digger has a below-ground reach of 8 feet and a 10-foot digging reach behind the tractor. It has a free-swinging arc of 140 degrees and is especially useful in areas where space is limited, the company says. To protect the tractor, a stabilizer frame on the tractor lift arms takes the digging thrust. The standard hoe-type shovel cuts an 18-inch-wide trench. The entire unit can be installed or removed from a tractor within 15 to 20 minutes, according to Sherman Products.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 287.

Lubrication Practices

The new folder offered by Master Lubricants Co., Meadow and Jackson Sts., Philadelphia, Pa., or 962 Fourth St., Los Angeles, Calif., covers its full line of Lubriko greases for antifriction bearings. The folder provides data on the application of 25 different Lubriko densities ranging from liquid greases to heavy cup lubricants.

This literature may be obtained from the company, or by using the Request Card bound in at page 16. Circle No. 281.

Today's Conditions DEMAND Salvage of Worn Equipment

Rebuild...Repair MANGANAL

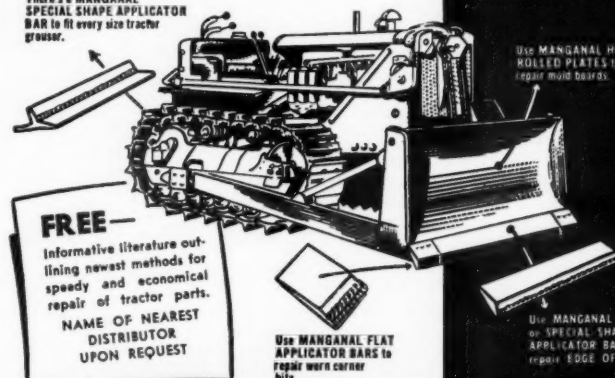
TRACTOR PARTS with U.S. Patents 1,876,738 - 1,947,167 - 2,021,945

11%-13½% Manganese-Nickel Steel
WELDING PRODUCTS

USE MANGANAL
BARE ELECTRODES

to rebuild worn drive sprockets, track rollers and idler wheels.

There's a MANGANAL SPECIAL SHAPE APPLICATOR BAR to fit every size tractor grouser.



FREE

Informative literature outlining newest methods for speedy and economical repair of tractor parts.

NAME OF NEAREST DISTRIBUTOR UPON REQUEST

Use MANGANAL FLAT APPLICATOR BARS to repair worn corner bits.

Use MANGANAL HOT ROLLED PLATES to repair mud boards.

Use MANGANAL ROUND or SPECIAL SHAPE APPLICATOR BARS to repair edge of blade.

STULZ-SICKLES CO.

SOLE PRODUCERS
91 N. J. Railroad Ave.
Newark 5, New Jersey

Cotton County Does Pay-as-You-Go Work

Sand-Asphalt Job Is Typical of Its Betterment Program Each Year; Uses Aerial Maps

COAHOMA County, located in the rich delta bottom lands of Mississippi, has an efficient highway department that operates on a pay-as-you-go basis. The county is free of debt, with no outstanding bonds, and each year improves a portion of its highway system. This betterment consists of upgrading dirt roads to gravel, or putting a hard-surface pavement on gravel roads. Last year 6 miles of pavement were laid by county forces.

Coahoma is an old Indian name meaning red panther. If around today, a panther would find little wooded area in Coahoma County in which to hide. The county is located in the great Mississippi delta that extends along the left bank of the river from Memphis, Tenn., south to Vicksburg, Miss. This flat, fertile area, once the bed of the Gulf of Mexico, is approximately 225 miles long and averages 40 miles in width. Its eastern boundary ends at the line of bluffs and rolling hill country at the edge of the flood plain.

Cotton is the money crop throughout the delta, and Coahoma County is covered with large plantations. The county has an area of 530 square miles, with the Mississippi River as its western boundary. It has a population of 48,000, of which approximately 20,000 reside in Clarksdale, the centrally located county seat. The Yazoo & Mississippi Valley Railroad of the Illinois Central System runs through the county, as do two U. S. highways, 49 and 61. Just north of Clarksdale on U. S. 61 starts a 32½-mile tangent, the longest straight stretch of concrete road in the world. It extends without a curve to Tunica, county seat of Tunica County to the north.

Coahoma County Roads

The county highway system includes 850 miles, of which 650 miles are gravel-surfaced; 100 miles blacktopped; and 100 miles of improved dirt roads that are graded and drained. This mileage is actively maintained throughout the year. Roads vary in width from 18 to 22 feet. The gravel on the gravel-surfaced roads forms a base with an average thickness of from 4 to 6 inches. When such roads are rebuilt with a blacktop pavement they may be either of two types. One type consists of a 4-inch gravel base covered by a 2½-inch road-mix bituminous mat, while the other is a 6-inch gravel base topped by a bituminous surface treatment.

Of the 6 miles improved last year by paving, a typical example of this construction by county forces is a 2-mile stretch running from the town of Farrell west to the river levee. The 18-foot pavement is a 2½-inch bituminous mat laid on a 4-inch gravel base. The mat is a road-mix made up of gravel, sand, and emulsified asphalt.

Native soils in the delta country, while excellent for agriculture, are too expansive and plastic for use as road-building material. But river sand in copious amounts is found along the river side of the Mississippi levees. This sand is blended with gravel that is hauled in from Panola County to the east where gravel deposits are found amid the rolling terrain.

The gravel may be loaded out from the pits by commercial suppliers, or the County may dispatch a shovel or dragline to the source of supply. Hauling is done by county equipment, usually

with a fleet of 7 Ford trailer trucks holding 8 yards in their specially built bodies. The haul is long, 50 miles one way. Sand is obtained more easily, a dragline digging the material from along the riverbank and loading it into trucks for a short haul to any part of the county.

Bituminous Mat

Sand and gravel were shaped into a single windrow down the center of the road, containing 4½ cubic feet of aggregate per linear foot of 18-foot-wide

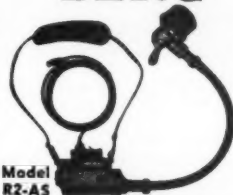
pavement. Shaping was done by a pair of motor graders—an Adams 550 and a Caterpillar 212. When the materials were well blended, the graders flattened out the windrow and spread it across the road. If too dry, water was added from a couple of tank trucks. Then emulsified asphalt was applied to the aggregate in shots of 0.5 gallon to the square yard until a total of 5.34 gallons had been applied for each linear foot

of pavement.

Bitumuls HCM, a stable mixing grade of emulsified asphalt containing an asphalt cement with 150-200 penetration, was supplied by the American Bitumuls Co. It was shipped in tank cars from a refinery at Mobile, Ala., to the Illinois Central Railroad siding near Farrell, where it was transferred into two county distributors—Etnyre 400-gallon

(Continued on next page)

"BERG" Concrete Surfer



Model R2-AS

A light-weight, portable, electric motor-driven Concrete Surfer consisting of the Model R-2 Right Angle Head and Model AS Motor Unit.

Ideal for surfacing concrete construction and other applications.

Quickly converted into the Model V2-AS Concrete Vibrator for internal vibration by substituting the Model V2 Vibrator Unit for the above Head.

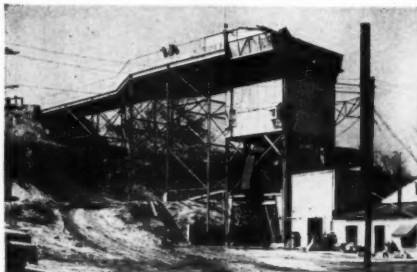
The Concrete Surfacing Machinery Co.

4665-4669 Spring Grove Avenue,

Cincinnati 32, Ohio

BLUE BRUTE USERS AGREE:

"It's a Great Line of Mixers!"



FOR CENTRAL MIXING
This modern plant of the Clark Certified Concrete Company, Inc., of Baltimore, Md., produced 125,000 yds. of pre-mixed concrete during the past year. Vice-President Duncan writes: "Your Blue Brute 84-S Stationary Mixer has proven entirely satisfactory. Maintenance costs have been practically nothing."



FOR PORTABLE MIXING. Le Roy W. Vival, chief engineer of the O'Sullivan Rubber Corporation, Winchester, Va., reports: "We are extremely gratified by our Blue Brute 3½ Tilt Mixer, which has had two years of constant, severe use. It is extremely mobile, well constructed and performs excellently. Long exposure has not decreased its efficiency. The mixing cycle is fast and the mix consistently uniform. It is a pleasure to endorse and recommend this equipment."



FOR TRANSIT MIXING. President Bob McCorkle of the Abilene, Texas, Concrete Company, gives his reasons for re-ordering Blue Brute Hi-Up Truck Mixers: "We have compared competitive makes on our jobs and find your Hi-Ups best in every way. Maintenance costs have been negligible. Just purchased your first chain-drive Hi-Up and find it even better than the older machines — faster charging and discharging, easier to maintain and smoother running."



FOR PLACING. In building the Washburn vehicular tunnel under the Houston, Texas, ship channel, the "Trench method" of construction was used. The last yard or two of concrete placed in each of the section joints had to be placed straight upwards — a tricky pouring problem. Merritt-Chapman & Scott Corporation reports an easy solution was found with the aid of a Blue Brute Pneumatic Placer, which performed excellently.

Yes, among Blue Brute owners it's a never-ending story of more concrete at lower cost, trouble-free operation, time and money saved in every detail of mixing operations. Why not look into this proof that *there's more worth in Worthington?* See your nearby Worthington-Blue Brute Distributor, or write for bulletins on mixer types in which you're interested.



BUY BLUE BRUTES



IF IT'S A CONSTRUCTION JOB, IT'S A BLUE BRUTE JOB

Worthington Pump and Machinery Corporation
Construction Equipment Department
Harrison, New Jersey

Distributors In All Principal Cities

WORTHINGTON



Cotton County Does Pay-as-You-Go Work

(Continued from preceding page)

and Littleford 800-gallon—both mounted on Fords. The bitumen was applied cold.

After each application the emulsified asphalt was mixed with the aggregate by the motor graders, as they windrowed the material back and forth across the road. After being thoroughly mixed, the mat was given a final shaping by the graders and rolled by a Galion 5 to 8-ton tandem roller. By using emulsified rather than cut-back asphalt, the County found that work might be undertaken earlier in the spring and continued later in the fall with less interference from rainy weather. Work could also be started sooner after a rain by using the emulsion.

County Organization

The governing body of Coahoma County is the County Board of Supervisors, a 5-man board whose members are elected to 4-year terms. The present board is made up of J. E. Merritt, President; J. B. Hopkins, H. J. Landry, D. L. Solomon, and W. E. Young. Solomon is also State Secretary of the Mississippi State Supervisors Association. The County Highway Department is the unit type, being under the direction of the County Engineer.

For 20 years Ben T. Collier was County Engineer. On May 15, 1950, Governor Wright of Mississippi appointed Collier to the post of Mississippi State Aid Engineer where he directs the Department of State Aid road construction under the Mississippi State



C. & E. M. Photo
An Adams 550 grader flattens a windrow of sand and gravel on a typical betterment job in Coahoma County, Miss. A Caterpillar 212 grader brings up the rear.

Highway Department. The State Aid Department and engineer's office were created by a special session of the legislature. Collier will supervise the improvement of 11,650 miles of roads with an estimated construction expenditure of \$8,000,000 annually.

The genial silver-haired official has been Consultant to the U. S. Bureau of Public Roads, Division 3, comprising seven southern states. In 1948-1949 Collier was President of the County Division of the American Road Builders' Association, and last year served as Chairman of the Nominating Committee. His successor as County Engineer is Eugene Offenbiser.

County Headquarters

County Highway Department headquarters are on a 6-acre site on the outskirts of Clarksdale in a frame office building. Other buildings include a large wooden shed for equipment stor-

age; a smaller shop for truck repairs; and a central sheet-metal shop. The latter measures 100 x 60 feet, and has a concrete floor and steel roof trusses. It is well lighted with overhead lights and large windows, and has large doors

on three sides. When equipment is brought to the shop for repairs, it is first cleaned on a Hypressure Jenny.

Shop tools for maintenance include a Lodge & Shipley lathe, 12-foot bed, 18-inch stroke; a Cincinnati drill press; a DeVilbiss air compressor; a Multiplex 50 wood worker; a Boice-Crane 12-inch planer; and a shop-made hydraulic press.

County highway equipment includes the following:

- 1 Cleaver-Brooks tank-car heater
- 1 Hobart electric welder
- 2 Athey Force-Feed Loaders
- 2 Ford tractor mowers
- 15 Ford dump trucks at 4 yards
- 7 Ford trailer trucks at 4 yards
- 1 Quikway crane on Brockway truck
- 1 Universal 1/2-yard dragline
- 1 Osgood 1/2-yard shovel
- 3 Caterpillar D7 tractor-dozers
- 1 Slusser-McLean 8-yard scraper
- 1 Galion 5 to 8-ton tandem roller
- 1 drop-hammer pile driver
- 2 Buckeye spreaders

(Concluded on next page)

Wagner HYDRAULIC LOADERS

WM3 Hydraulic loader with material bucket Patents and Improvement Patents applied for.



unlimited time & effort savings

You save money when Wagner Loaders take over your material handling problems.

USES MULTIPLY with 15 interchangeable attachments



Cool Bucket Snow Bucket
"V" Snow Plow Concrete Bucket

AVAILABLE FOR:

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Farmall Cub Allis-Chalmers WD
Case VA & VAI-VAC LeROI-Centaur & Tractor
AND MANY OTHERS

LOW INVESTMENT in a Wagner Loader is quickly written off as it pays for itself in more efficient material handling.

BUSY THE YEAR AROUND Wagner Loaders with 15 interchangeable attachments can be applied to over 50 different material handling problems.

EASY TO USE, the hydraulic double-acting controls put power at your finger-tips for fast precise operation of lifting and operating cylinders.

AND THEY STAY ON THE JOB Wagner loaders are built to withstand years of hard service. They have many outstanding extras in sturdiness that include: precision built gear type oil pump, heavy combination bumper and radiator grill guard, strong tubular structure.

DECIDE NOW to be one of the 35,000 users benefiting from unlimited time and effort savings with the Wagner Loader.

wagner TRACTOR LOADER

Please send complete information on loader for tractor, model I am interested as ☐ user; ☐ dealer.

Name _____

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City _____ State _____

MAIL TODAY

Wagner Iron Works — Dept. 17-3
1905 S. 1st St., Milwaukee 1, Wis.

The New TRIPLEX BACKFILL TAMPER

ONE MAN does a THREE-MAN JOB in 50% LESS TIME

TESTED, PROVED AND IN OPERATION AT

MOST BUREAU OF RECLAMATION DAM PROJECTS IN THE WEST; ALSO ON ATOMIC ENERGY PLANT PROJECTS, AS WELL AS MAJOR HIGHWAY AND AIR FIELD CONSTRUCTION WORK.



Mountings Available For Any Make Tamper

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GUNDERSON-TAYLOR MACHINERY CO.

Manufacturers and Distributors

988 CHEROKEE STREET • DENVER 4, COLORADO

- 1 17-ton trailer
- 1 Caterpillar pull grader
- 2 Adams pull graders
- 1 Etnyre 400-gallon distributor
- 1 Littleford 800-gallon distributor
- 1 Jaeger 2-bag concrete mixer
- 4 Caterpillar 212 motor graders
- 4 Caterpillar 12 motor graders
- 1 Adams motor grader

Finances

The county budget for the fiscal year, October, 1949, to October, 1950, was \$327,000, made up of \$144,000 from gas taxes; \$65,000 car and truck license tags; \$100,000 ad valorem property tax; and \$18,000 Homestead exemption refund. Gas and license revenue is obtained through the State. Coahoma County bonds that have been sold obtain a lower interest rate than those of many large municipalities throughout the country.

A good check on the entire county highway system is had every day through the reports of mail carriers who cooperate by advising the Highway Department of places in the road that are in need of repair.

A feature of the Highway Department is the use of aerial maps in laying out new work, especially helpful with regard to drainage. The maps cost \$25,000, but that sum was paid off in two years when they were used for tax purposes in settling decisions as to whether land was open or wooded. The taxpayers approved of this impartial judgment as decided by reference to the maps. They are scaled 600 feet to the inch, and are tied in to ground control points by transit surveys. They have been useful in determining the location of new county roads which have been petitioned. Average cost of a mile of county road—gravel base and blacktop pavement—is \$7,500.

Coahoma County Highway Department has an equipment inventory valued at from \$75,000 to \$100,000. Personnel numbers 60.

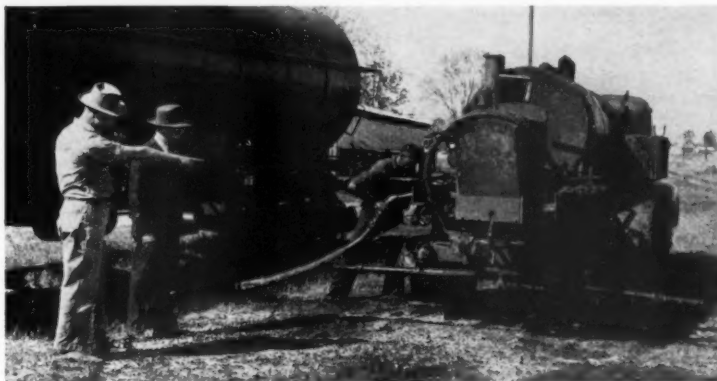
Wage Adjustment Board Activities Are Reviewed

"The Wage Adjustment Board" by John T. Dunlop and Arthur D. Hill analyzes and evaluates the work, the policies, and the decisions of that wartime wage-stabilization agency in the building and construction industry.

The authors explain the nature of the industry, the wage-making processes within it, and the principal problems which confronted wage stabilization. They show how these problems were related to the economic, technical, and collective-bargaining relationships peculiar to this industry, stressing the necessity of special arrangements for job-site employment, and the inapplicability of production-plant rules to construction.

The present emergency has revived public regulation in some areas of the industry. It seems probable that wage stabilization will follow. This book should therefore be of interest to both labor and management in construction.

John T. Dunlop, labor economist and arbitrator, is a consultant to various Government agencies. He is at present Chairman of the National Joint Board for Settlement of Jurisdictional Disputes in the Building and Construction



C. & E. M. Photo
Joe Wadsworth (pointing), representative of American Bitumuls Co., and former Coahoma County Engineer Ben T. Collier watch an Etnyre distributor load at a railroad siding. Collier is now Mississippi State Aid Engineer.

Industry. Arthur D. Hill, Assistant to the General President, International Union of Operating Engineers, was Co-Chairman of the Wage Adjustment Board from its inception, and later

Chairman. The book is a publication of the Jacob Wertheim Research Fellowship.

Copies may be obtained from the Harvard University Press, Cambridge

38, Mass., or at your local bookstore. The price is \$3.50.

Tubular-Steel Hoist Towers

Late developments in hoist-tower design and construction are revealed in a new 6-page bulletin, "Gold Medal Hoist Towers", recently issued by The Patent Scaffolding Co., Inc., 38-21 12th St., Long Island City 1, New York, N. Y. Use of tubular-steel components, it is claimed, contributes to safety, efficiency, economy, appearance, and low-cost service.

Dimensions, specifications, and diagrams for both light and heavy towers are included. Sketches and photographs illustrate actual applications. One picture shows eleven steel hoist towers on a housing project, on which a total of eighteen towers were erected, each to a height of 180 feet.

Bulletin No. HT-2 describing these hoist towers may be secured from the company. Or use the Request Card at page 16. Circle No. 306.

B.F. Goodrich



The tire that should lose but doesn't

WHEN water, sharp rocks and rubber start fighting—it's usually the tire that has the handicap. The water acts as a lubricant, causing the tires to spin—while the sharp rocks cut at the slipping rubber.

But the BFG Rock tires shown above are an example of how B. F. Goodrich builds tires to lick tough problems.

To resist cutting, these tires have a special, tough tread—compounded for rock service. To resist slippage, the heavy cleats on the shoulders are non-directional . . . they dig in for a non-slip bite, in forward or reverse. To give real shock protection to the cord body, these and other B. F. Goodrich off-the-road tires have a patented nylon

shock shield (double in larger sizes).

Found only in BFG tires, the shock shield is made of two nylon cord breakers. This is vulcanized between the tread and cord body to protect the life of the tire against the shocks of hard service.

The Wallowa County Road Department office in Enterprise, Oregon, operators of the equipment shown above, have this to report: "The B. F. Goodrich tires have given longer and better all-around service than any other brand we have used." In other words, the tire that's hard to cut is the tire that cuts costs.

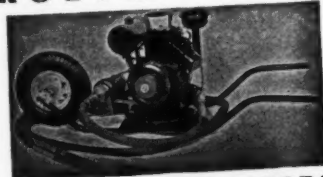
Whatever job your off-the-road equipment must perform, there's a

special BFG tread built to help you do it better. In addition, you get the exclusive protection of the nylon shock shield at no extra cost.

So see your B. F. Goodrich dealer. And specify BFG tires for your new equipment. Enjoy the longer life and lower operating costs offered you by The B. F. Goodrich Company, Akron, Ohio.



ROETH



CONCRETE VIBRATORS
MOUNTED ON WHEELBARROW CHASSIS
Write for details and prices
ROETH VIBRATOR CO.
1737 Farragut Ave.
Chicago 40,
Ill.

New Wetting Agent Improves Concrete

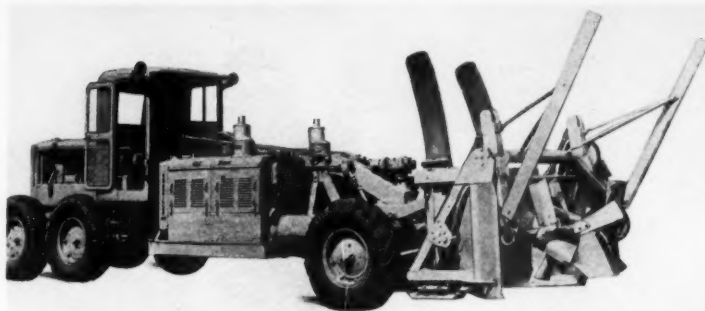
Denser, stronger, and more uniform concrete blocks and bricks may be obtained by the addition of a surface active agent, Santomerse S, according to a recent announcement by Monsanto Chemical Co., St. Louis 4, Mo. The addition of this liquid wetting agent to the mix enables the use of less water, thereby producing a so-called "dry" concrete, the company says; at the same time the plasticity required to mold blocks and bricks is improved.

Other features claimed for its use are: cleaner equipment, lighter-colored products, and better dispersion of cement. Monsanto recommends about 8 ounces of the chemical for each five-bag cement mixture. It may be added either before or after the cement. About one-third of the water required is added at the same time and mixed thoroughly. Santomerse S is available in 250 and 450-pound containers.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 391.

CEMA Elects

At the annual meeting of the Conveyor Equipment Manufacturers Association, W. E. Madden, Vice President of George Haiss Mfg. Co., Inc., division of Pettibone Mulliken Corp., was elected Chairman of the Portable Conveyor Group, to serve for one year. B. W. Reeve, Vice President of the Lake Shore Engineering Co., was elected Vice Chairman.



The Bros Sno-Flyer ready for action, mounted on a Model 12 Caterpillar motor grader.

Rotary Snowplow Mounts on Graders

"You can now protect a road budget by putting your Caterpillar and Allis-Chalmers' motor graders to work the year around", says Wm. Bros Boiler & Mfg. Co., 1057 Tenth Ave., S. E., Minneapolis 14, Minn. The Bros Sno-Flyer rotary plow is now adaptable to motor patrols. It provides fast snow removal, plus additional auxiliary engine power for other jobs, the company points out.

When snowplowing is over, the auxiliary engines used to operate the plow are available for many jobs such as motor-grader replacements, power for generators, air-compressor units, hoists and derricks, rock crushers, etc. The Sno-Flyer rotary features close-to-ground cleaning, snow streams individually controlled from the cab, full 360-degree revolving chutes which allow complete casting control in any direc-

tion, and wide plowing width.

The company points out that it is not necessary to have a factory mounting. The Sno-Flyer can be delivered in "package form" ready for mounting on your grader by any Caterpillar or Allis-Chalmers' dealer. Hitch assemblies, engine-mounting frames, drive assemblies, and controls are included in

the package. As a special feature, when gasoline engines are desired, two industrial-type Ford engines can be included in the package.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 297.

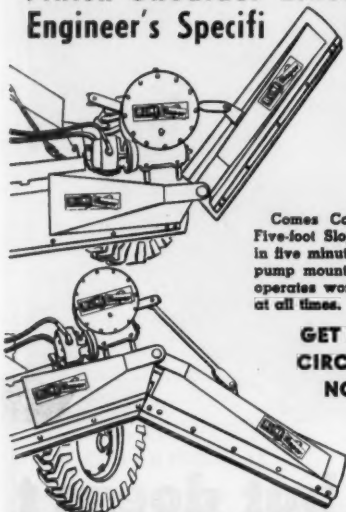
Portable Fueling Pump

Literature describing the Sheldon portable refueling pump is available from its national distributor, Cusenbary Sales Co., Cunningham, Kans. This pump, the folders point out, can deliver 15 gallons per minute and lift gasoline 15 feet or higher. It will prime itself when dry, and it drains quickly. The pump features all-metal construction and is available with 10 feet of one-inch Neoprene hose and a 3-foot strainer tube. The circulars illustrate use of the pump in the field and provide complete specifications.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 256.



Finish Shoulder Lines and Inside Slopes to Engineer's Specifications in Half the Time



Blade over the edge of a fill, finish the inside slope, mark the shoulder line and complete the shoulder work in ONE operation with a B-Line Sloper. Keeps grader well away from soft edge of fill. Saves time, money; makes engineers happy.

Comes Complete. Makes your No. 12 more versatile. Five-foot Sloper Wing slides on or off No. 12 mold board in five minutes' time. Power control by means of hydraulic pump mounted on grader frame. Smaller hydraulic motor operates worm and gear. Instantly adjustable by operator at all times.

GET FREE CIRCULAR NOW

Shows many uses. Pays for itself quickly. Cleans fill slopes, drifts materials, extension for high banks, etc. Write, phone or wire for full details now.

CENTRAL CONSTRUCTION COMPANY

Indianapolis, Iowa



...there's a DORSEY LOW BED HEAVYDUTY Trailer for every Haul...



No matter what your heavy hauling problems are, you can easily solve them all with DORSEY LOW BED HEAVY-DUTY TRAILERS.



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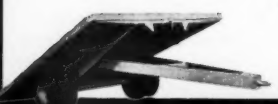


These Low-Bed trailers in standard models are available in capacities from 10 to 75 tons. The specifications include a wide variety of standard options, readily adapting any unit to specific requirements. In addition, experienced engineering is available to assist in solving unusual transportation problems.



Tilt-To-Load Trailers

Perfect for light trailer requirements. Available in 7,500, 15,000 and 20,000 lb. capacities. For use with trucks or tractors.



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The Dube mechanical hoist for dump trucks operates at 70 degrees below zero to 120 degrees above, and has a 55 to 60-degree dumping angle.

A Mechanical Hoist For All Dump Trucks

A new mechanical hoist, designed for efficient operation at temperatures of 70 degrees below zero or 120 degrees above, has been developed by Detroit Mechanical Hoist Corp., 3502 W. Fort St., Detroit 16, Mich. Because it is factory-equipped with positive power-down as well as power-up, and has a 55 to 60-degree dumping angle, the Dube mechanical hoist is said to be efficient for all spreading and dumping operations.

The power to lift the load is taken from the truck engine through conventional power takeoff to a speed reducer and cone worm and gear set. The cam and roller principle combined with lifting arms generates the power to dump the load. Capacities range from models designed for light, medium, and light-heavy trucks, to a model designed for heavy-duty dump trucks having a gross vehicle weight of 23,000 to 28,000 pounds. The Dube hoist has a 600 to 1 overall gear-reduction ratio.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 331.

New Installation Manual For Culverts and Drains

A new 46-page pocket-sized manual outlining installation procedures for Armco drainage products has been issued by Armco Drainage & Metal Products, Inc., Middletown, Ohio. The manual discusses, in problem and solution method, unloading and handling, locating the drainage structure, methods of excavation and preparation of base, and other preliminaries. It then details the assembly of the various structures used in drainage work, and the proper methods of backfilling. Sketches and engineering drawings supplement the text. The booklet includes information on underdrains, culverts, abutments and bridge drains, etc.

This manual may be obtained from the company, or by using the Request Card at page 16. Circle No. 344.

Engine-Lathe Catalog

Catalog No. 183 on the new Model S engine lathe is available from The Springfield Machine Tool Co., Springfield, Ohio. Its 8 pages explain the most important parts and features of this new lathe; there are large front and rear views of the lathe, plus complete specifications.

Springfield's Model S offers versatil-

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ity, precision, capacity, ease of control, and stamina, the catalog says. It is described step by step from spindle head and feeds through to tailstock and pan. The catalog also lists standard equipment and accessories.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 365.

Machine-Bolt Anchors

A pocket-sized folder offering quick facts about the use of multiple-unit caulk-type machine-bolt anchors has been prepared by U. S. Expansion Bolt Co., York, Pa. These anchors may be used with any standard machine bolt or threaded rod for anchoring in all types of masonry, the literature says. The folder includes a complete description of the various types, specifications, and list prices. It also gives information on installation methods.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 291.

Construction Products

Listed in New Handbook

A new 96-page pocket-size handbook of construction materials has been prepared by A. C. Horn Co., Inc., Tenth St. and 44th Ave., Long Island City 1, N. Y. It contains information on a wide variety of products, including caulking, roofing and flooring compounds, exterior and interior paints and coatings,

form coatings for concrete construction, and admixtures for concrete improvement. A number of special tables are provided for calculating quantities of material required. The handbook also describes, suggests applications, and indicates covering capacity of each product.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 269.

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Caissons Are Sunk For Bridge at Yorktown

Six Steel Shells Are Towed Into Position, Anchored, and Then Sunk Slowly as Concrete Is Placed in 9-Foot Lifts

♦ AFTER more than 20 years of unsuccessful planning and negotiating, by state and private interests, to span the York River at Yorktown, Virginia, all obstacles have been overcome, and a bridge is now under construction which is scheduled for completion early in 1952. Financing, World War II, and choice of design had been the major factors holding up the work. The Vir-

ginia Department of Highways finally resolved such difficulties to permit the \$9,000,000 project to get under way in December, 1949.

The substructure is being built by the Massman Construction Co. and the Kansas City Bridge Co., both of Kansas City, Mo., under a joint-venture contract of \$4,690,232. The Virginia Bridge Co. of Roanoke, Va., was awarded the superstructure contract on its low bid

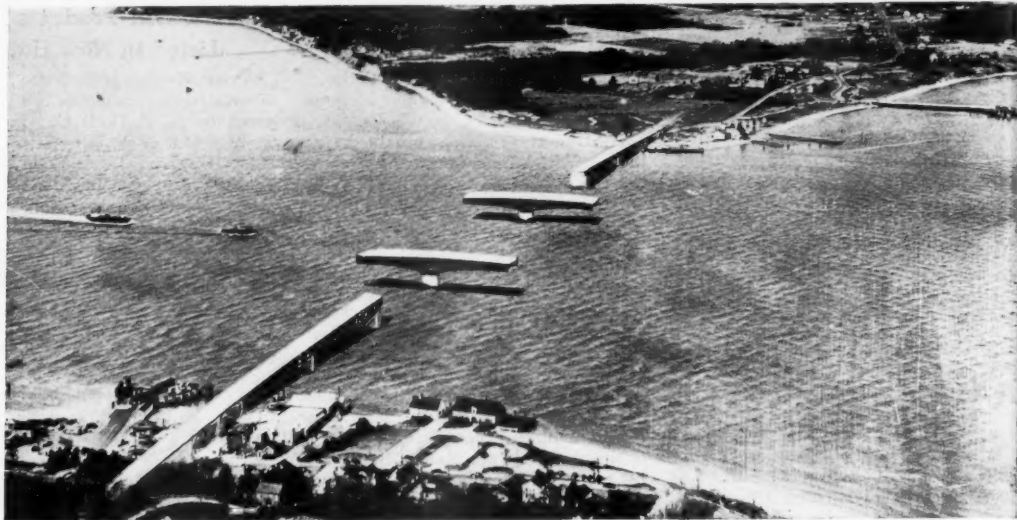
By WILLIAM H. QUIRK,
Eastern Editor

of \$2,242,711. The bridge was designed by the consulting engineering firm of Parsons, Brinckerhoff, Hall & Macdonald of New York City, which is also supervising the construction.

The structure is 3,750 feet long, from Gloucester Point on the north bank of the York River to historic Yorktown on

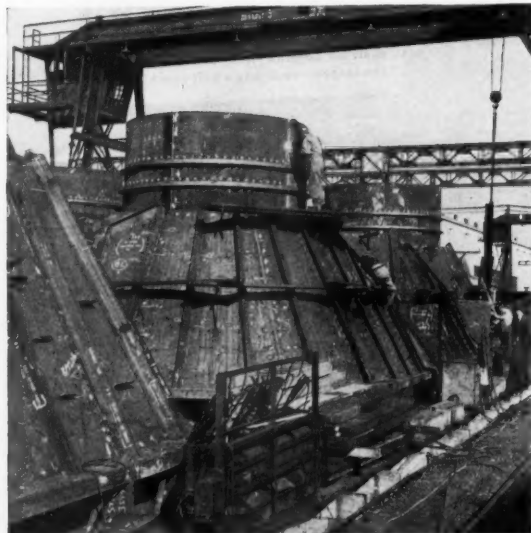
the south bank. It will carry U. S. 17 over the broad and deep river, replacing the present ferry at that point. Though not the longest bridge in Virginia, it will be the largest ever built by the Highway Department from the standpoint of cost and the quantity of material used in its construction. On both sides of the river new approaches will be constructed having a 22-foot

(Continued on next page)



LeRoy Anderson Photo, Virginia Dept. of Highways

When it is completed early in 1952, the double-leaf swing-span bridge over the York River will be the largest of its type ever built, with 500-foot spans providing a clear 450-foot channel. T. E. Burton did this drawing of the bridge.



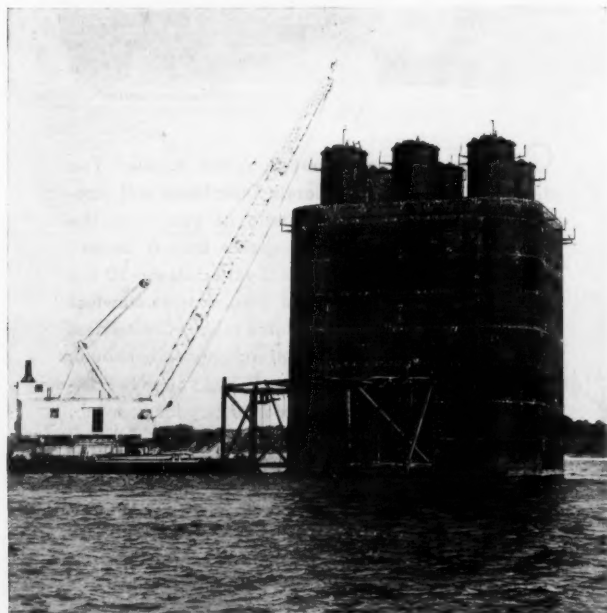
Virginia Dept. of Highways Photo

The Newport News Shipbuilding & Dry Dock Co. constructed the six huge steel caissons for the river piers.



Dan Caldwell Photo, Virginia Dept. of Highways

Pulled by two tugs, the caisson for river pier 1-N starts its floating voyage 40 miles from Newport News to the Yorktown site. The caisson is 66 x 52 feet and 110 feet high, and draws 33 feet of water.



Dan Caldwell Photo, Virginia Dept. of Highways

Arriving at Yorktown 30 hours later, the caisson is pushed between steel towers driven to exact position in the riverbed.



Dan Caldwell Photo, Virginia Dept. of Highways

An engineer on the Yorktown side lines up the caisson as it is placed in the towers. Massman Construction Co. and Kansas City Bridge Co. hold the \$4,690,232 substructure contract.

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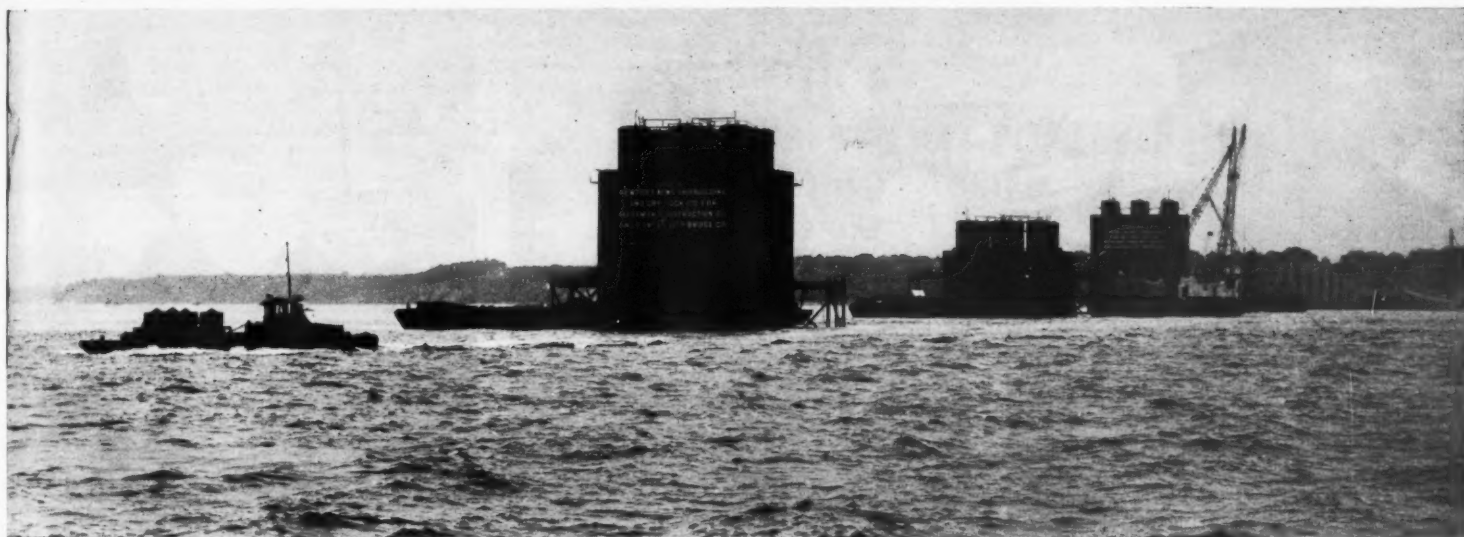
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C. & E. M. Photo

Looking across the York River, we see three caissons in position—1-S, 1-N, and 2-N. The tug with the concrete-bucket barge is coming in for more concrete.

concrete pavement.

Double-Leaf Swing Span

In the early planning, both a high-level suspension span and a double-leaf bascule-type drawbridge were discussed. Objections were raised to these designs on esthetic grounds, for the frameworks of such bridges, high in the air, would be visible from the Yorktown battlefield site, and thus intrude on the historic atmosphere. Consequently a double-leaf swing-span design was chosen which will be the largest of its type ever built. Two 500-foot swinging spans will provide, when open, a clear 450-foot channel, thus permitting the passage of the largest war vessels in water 80 to 90 feet deep. When closed, the vertical clearance under the moving spans will be 60 feet.

Going from the south abutment to the north, the lengths of the individual spans are: two at 65 feet; four at 90 feet; then 280, 350, 390, 500, 390, 350, 280 feet; followed by eight spans at 90 feet. Piers are numbered both ways starting from the main channel. Those on the south side go from 1-S to 9-S, while the north-side piers are designated 1-N to 11-N. The three big piers on each side of the main channel—1-S, 2-S, 3-S, 1-N, 2-N, and 3-N—are caissons. Piers 4-S and 4-N are built inside steel cofferdams, and are supported on timber piles; they have tremie-concrete seals as do the six large piers.

The two prime contractors are building these eight river piers with floating equipment. They sublet the construction of the remaining 12 piers and 2 abutments to W. F. Magann Corp. of Portsmouth, Va., and F. J. Gannaway of Norfolk, Va. Their work was all on land, and was done with land equipment. Piers 4-S through 9-S and 4-N through 11-N rest on timber piles. The abutments are founded on concrete-filled monotube piles.

Bridge Caissons

Work on the project got under way with the driving of timber piles in open excavation for the north approach land piers 5-N through 11-N. The winter of 1949-50 was mild in southern Virginia, (Continued on next page)

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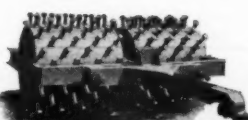
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C. & E. M. Photo
At the batch plant a Smith 4½-cubic-yard truck mixer on an International truck gets cement from a Butler bin.



C. & E. M. Photo
A Smith truck mixer on a GMC backs up a ramp over the water and discharges concrete into a hopper.



C. & E. M. Photo
The hopper discharges concrete into 2-yard Wiley buckets on the deck of a barge towed by the tug C. S. Tupper.

Caissons Are Sunk For Yorktown Bridge

(Continued from preceding page)

and with steady progress this end of the job was finished in May. The 500-foot-long approach fill, 40 feet in height, on the Gloucester shore was also completed last December and January by subcontractor E. V. Williams Co. of Norfolk, Va. About 74,000 cubic yards of material make up the embankment.

While these operations were going on, the Newport News Shipbuilding & Dry Dock Co. of Newport News, Va., had started constructing the six huge steel caissons to be used as permanent

forms to support the six river piers. The two largest caissons for piers 1-S and 1-N are 66 feet long x 52 feet wide, 110 feet and 101 feet high respectively, and weighed around 2,300 tons before being sunk. This weight included 14 feet of concrete which was placed in the bottom sections of the caissons around the dredging wells during their construction to give stability to the big shells while they were still floating. Approximately 800 cubic yards of concrete was placed in the base of each caisson.

Caissons for piers 2-S, 3-S, 2-N, and 3-N are slightly smaller, being 66 feet long x 42 feet wide. All caissons have

(Continued on next page)

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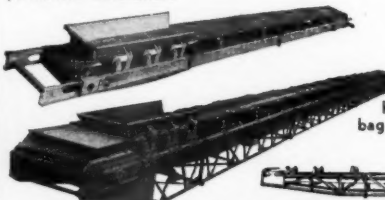


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six dredge wells; in the two large caissons the wells are 12 feet in diameter, while in the other four the dredge wells have a diameter of 9½ feet. Their construction is similar, with a ¾-inch steel-plate skin backed with horizontal 12-inch WF 38-pound beams for wales, spaced on 3-foot centers. Cross bracing includes three main struts—12-inch WF 40 to 65-pound beams—one lengthwise down the center of the caisson between the two rows of dredge wells, and the other two across the caisson between the wells. The cross struts frame into vertical soldier beams—18-inch WF 50 to 70-pound members—around the sides of the caissons.

Cutting edges around the bottom of the dredge wells are 10 feet deep; the edge itself is a ¾ x 18-inch plate secured to a 6 x 6 x ¾-inch angle. The dredge wells were constructed to a height of 16 feet above the tops of the caissons, and were capped and sealed during the sinking. The caisson for 1-S goes down to elevation minus 150, mean tide (0-0), and 1-N goes down to minus 141. The average depth of water at the main piers is about 80 feet. When sunk, the tops of the caissons are 40 feet below the surface of the river, while their bases are 70 to 75 feet beneath the riverbed. The four other slightly smaller caissons are sunk to depths ranging from 60 to 85 feet beneath the riverbed. The first 20 feet of the riverbed consists of mud and clay overlying strata of sand, and sand mixed with shells.

Anchoring the Caissons

The first caisson, 1-N, was floated from the Newport News dry dock, in which it was constructed, on March 21, and then towed 57 miles in 30 hours through Hampton Roads into Chesapeake Bay and up the York River to the bridge site. The 110-foot-high caisson drew 33 feet of water, leaving 77 feet of shell extending above the surface. Caisson 1-S was launched at the same time but was not brought to the site until April 11. Caisson 2-N was the next to be delivered, arriving on June 20. The remaining three caissons were completed and launched on June 19, but were delivered to the site only as needed, or at about six-week intervals.

At the site the Massman-Kansas City contracting combine had assembled an adequate fleet of floating equipment that included four oil-burning steam cranes mounted on 46 x 80-foot steel barges. Two of these were American Revolvers, Model 1085, with 125-foot booms, and two were Clyde Whirlleys with 100-foot booms. Ten barges were available for supplies, and towing was handled by three tugs—the 65-foot East Wind powered by an Atlas 220-hp diesel engine; the C. H. Van Horn and the C. S. Tupper, each 43 feet long and driven by General Motors 165-hp diesels. Job personnel was moved about on the Hammerlock—a 24-foot launch equipped with a GM 150-hp diesel engine.

Each caisson was anchored in position by four steel pipe towers, one on each side of the shell, and tied together with yokes secured to the outer pipes. These towers of tubular seamless steel were made up by the Wiley Mfg. Co. at Port Deposit, Md., which also supplied to the job 2-yard concrete buckets and the elevator shaft down which they were dropped into the caissons.

Pipe Anchor Towers

The pipe anchor towers varied in height from 110 to 115 feet, and were 20 feet square. At each corner was a 14-inch OD pipe. These vertical members were braced at 20-foot intervals with 10-inch pipe for horizontal and diagonal struts. Inside the 14-inch pipe were driven 12-inch OD pipes from 140 to 150 feet long which spudded the corner columns firmly into the river bottom. The tower assembly was handled by the floating rigs, and the spud driving was done with a McKiernan-Terry

10-B-3 hammer. The spuds went 60 feet into the riverbed, and were shimmed at the top for additional stability.

Three of the towers at a pier site were driven in the first operation, with the fourth side left open to admit the caisson. Tow lines on the caissons were switched from the tugs to the floating rigs which pulled the caissons into position. Then the fourth tower was driven in place leaving only about an 8-inch clearance around the caisson, which was taken up by slipping a beam between the shell and tower on each side. Three complete sets of four mooring towers were available in the sinking of three caissons at a time. Caissons 1-S, 1-N, and 2-N were sunk first, followed by 3-N, 2-S, and 3-S. The spud tubes were pulled from the corner columns, after the caisson was sunk, with a Vulcan 400-A extractor.

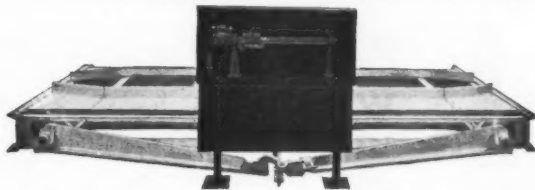
One of the anchor towers at each caisson supported a platform on which was mounted a Worthington Blue Brute 500-cfm air compressor to run the pneumatic tools and to maintain air

pressure in the sealed dredged wells. The maximum air pressure in the dredge wells never exceeded 30 pounds to the square inch, and generally aver-

aged about 18 pounds. This air pressure was maintained so that the caisson would not sink too fast with respect to
(Continued on next page)

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Caissons Are Sunk For Yorktown Bridge

(Continued from preceding page)

the unseasoned concrete. According to the contractor's sinking schedule, with the buoyancy of water figured at 63 pounds to the cubic foot, the caissons were considered as being supported by

flotation only until the cutting edges reached minus 101, in the case of 1-N, and minus 110, for caisson 1-S.

Thus this air in the wells supported the caisson in equilibrium at the various stages of sinking, and was either increased or decreased to meet the exact conditions for the various stages. The pressure of air in the wells provided sufficient buoyancy to prevent the

hydrostatic head on the unsupported caisson shell from exceeding the amount shown for each stage. The unsupported portion of the shell was considered as extending from the surface of the river to the top of the outside wall of seasoned concrete.

Sinking the Caissons

The caissons were sunk by weighting them with reinforced concrete forming a wall 4 feet thick around the perimeter, and 3 feet thick for the interior cellular walls. These interior walls encased the steel beam struts that cross braced the caisson on each side of the dredge wells. The concrete was generally placed in 9-foot lifts in the sinking process, with the outer wall going up first followed by the interior walls.

Forms of 3/16-inch steel plate, made by the Havens Structural Steel Co. of Kansas City, Mo., were used to contain the concrete. They were backed with 4-inch 5.4-pound channels as studs, on 16-inch centers, and double 6-inch 8.2-pound channels back-to-back as wales. On the outer walls the wales were spaced on 3-foot centers, while for the thinner inside walls the spacing averaged 4 1/2 feet. Williams 3/4-inch rods were used for form ties. On the outside walls the sleeve nuts on one side were welded to the ribs of the caisson for support, with she bolts at the other end. On the inner walls she bolts were used on both sides.

Reinforcing steel was supplied by the Virginia Steel Co. of Richmond, Va. It was loaded onto barges at the site by a P&H crane equipped with an 80-foot boom. The interior walls were reinforced with 3/4-inch bars, set 12 inches on centers both ways. The exterior walls were reinforced with 3/4-inch vertical bars at 12 inches on center and 1-inch horizontal bars spaced 4 to 12 inches on centers. Holes were burned in the ribs to admit the vertical reinforcing.

Concrete Handling

Ready-mixed concrete for the project was supplied by the Yorktown Ice & Storage Corp. of Yorktown, Va., which set up a new batch plant along the side of a hill close to the river. The plant consisted of a Butler 300-barrel cement bin, and a Butler 90-ton 3-compartment aggregate bin, erected on concrete footings and enclosed with corrugated-metal siding for winter operation. Lone Star bulk cement was shipped in cars from the Norfolk, Va., plant to the

Chesapeake & Ohio Railway siding at Lee Hall, Va., 6 miles from the batch plant to which it was hauled in covered trucks. At the plant the trucks backed out a wooden trestle, level with the top of the hill, to discharge their loads into a hopper at the top of the cement bin. A Gilbarco air compressor agitated the cement in the bin to insure a ready discharge when needed.

Sand and two sizes of gravel aggregate were supplied by Southern Materials Co., Inc., and shipped by barge from Norfolk, Va., up the James River to a dock near Lee Hall, Va., where they were unloaded by crane into hoppers on the bank, and thence into trucks that hauled them to the batch plant. The sidehill location permitted the trucks to empty their loads directly into the bins. Water for the mix was pumped from a well into a 10,000-gallon storage tank on top of the hill, from which it flowed by gravity into the plant. To each 5 1/2-bag-per-yard batch of Class A concrete placed in the caisson, 4.95 ounces of Daxex was added to the mixing water to give the Type 2 cement concrete an average air content of 4 per cent.

Batches were mixed in Smith 4 1/2-cubic-yard truck mixers mounted on either International or GMC trucks for at least 6 minutes. They drove under both plants to pick up their batches. The dry batch weights for a yard of Class A concrete used on the project were as follows:

Cement	517 lbs.
Sand	1,112 lbs.
Coarse gravel, 2-inch	1,007 lbs.
Fine gravel, 1-inch	1,007 lbs.
Water—31 gallons	258 lbs.
Total	3,901 lbs.

For tremie concrete used in pouring the seals, the mix was enriched to 6 1/2 bags of cement to the yard.

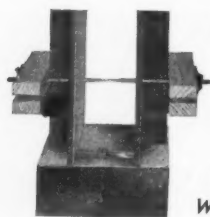
Truck Mixers to Barge

Using three truck mixers, the contractor averaged .60 yards of concrete an hour for normal caisson wall pours; with four units the production was increased to 80 yards an hour on the tremie pour for the approach pier 4-N. This rate sufficed with the type of work involved since the caissons were sunk slowly and carefully, and each course had to harden before additional concrete was placed. The truck mixers ran across the road from the batch plant, and backed up a timber ramp overhanging the river. At the end of this pier, wide enough to accommodate two mixers, was a 10-yard hopper into which the truck mixers unloaded their concrete. Two discharge gates on the hopper emptied the concrete into Wiley 2-yard concrete buckets set on the deck of a barge, which was then towed out to the caisson being sunk.

A typical pontoon barge for concrete hauling was 50 feet long x 18 feet wide x 4 feet deep, and handled four full buckets with space for a fifth empty bucket. They were manipulated directly under the overhanging pier by one of the tug boats. At the caisson the 2-yard buckets were picked up by one of the floating cranes and placed in the elevator guide frame down which they were lowered to the level of the concrete being poured. The guide frame consisted of four steel channels with a 3-yard hopper at the bottom into which the buckets were emptied.

From the hopper the concrete was discharged into Jackson rubber-tired buggies—about a dozen were used—and wheeled to the forms. Elephant-trunk pipe was used in placing the concrete, which was vibrated with Viber and Mall vibrators. From 10 to 12 vibrators were in service during the operations. The first concrete lift was placed in caisson 1-N on April 26 for an outer-wall pour. At the beginning three barges were used for transporting the concrete buckets, which were handled by two floating rigs, one on each side of the caisson being sunk. As

(Concluded on next page)



For better alignment

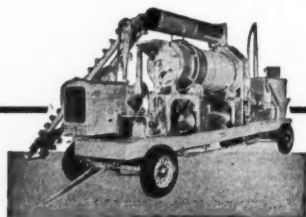
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Portable Asphalt Plants For City, State, Repairs and Small Contract Work

These 8-10 tons per hour Asphalt Plants economically repair almost any pavement. Asphalt, brick, concrete, macadam, can be resurfaced or patched. Alleys, driveways, sidewalks, industrial plants can be paved.

Produce for immediate hot laying, or for deferred cold patching. Match any bituminous surface.

Mixes at plant, including labor, fuel, and overhead, cost about \$4 per ton, with \$2 aggregate. Average 160 to 200 sq. yds. 1" thick per hour. A moneymaker for small contract work.

Also larger plants, 15 and 30 tons per hour.

Write for catalog and name of nearest dealer.

Elkhart

White Mfg. Co.

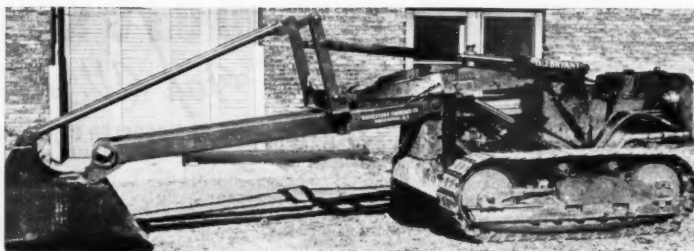
Indiana

HEAVY-DUTY TRENCHER

A heavy-duty trench digger, which is designed for a wide variety of trenching for any highlift tractor with hydraulic bucket control.

It will increase the tractor's production from 30 to 50 per cent, and is easily attached by one man in 15 minutes.

The Whitestown trencher is equipped with a 1/2-yard standard bucket. Special buckets, made to individual specifications, may be obtained. It will dig to a depth of 8 feet and dump at a height of 12



The Whitestown Trencher is now available for use on the following hydraulic controlled tractors:

Allis-Chalmers HD-5G equipped with TS-5 Tractor-Shovel Caterpillar D-4 and Trackson HT-4
International TD-6 & TD-9 equipped with new Bucyrus-Erie dozer-shovel.
International TD-6, TD-9 & TD-14-A with Hough Bulldozer-shovel
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years, and has proved to be rugged and satisfactory in every way.

Immediate delivery can be made.

WHITESTOWN TRENCHER CO., INC.

Wood Road, Whitesboro, New York

Phone: Utica 6-1117

job efficiency quickly increased, the same results were obtained with only two concrete barges and one floating crane.

Tremie Pours

When the bottom of a caisson reached the bed of the river, a temporary cofferdam of steel was bolted to the top flange of the caisson, extending upwards 48 feet above its top. This extension insured 8 feet of freeboard, since the top of the caisson eventually was sunk to 40 feet below the surface of the river. The dredge wells were extended 32 feet, bringing them up to the top of the cofferdam. Some dredging had been done through the wells, which were uncapped when the river bottom was reached, before the extensions were added. The excavation was done with 2-yard clamshells mounted on the floating rigs.

To reduce the skin friction near the end of the sinking operations, and for washing around the sides of the caissons, a Griffin 1,050-gpm and a CMC 4-inch pump were used for jetting. Standard 3-inch pipes were attached to a manifold off the pumps. When the dredging was completed and the caisson had reached its final position, the tremie-concrete seal was poured through the dredge wells. In each of the two large caissons the seal involved 900 yards of tremie concrete; in the others the tremie concrete amounted to 670 yards in each shell, about the same amount of concrete that had been placed in them before launching as a stabilizer.

After the tremie seals were poured, the dredge wells were filled with water, cut off just below the top of the caisson, and capped. A 4-foot concrete slab was poured on top of the caisson on which the bridge piers are built. Piers 1-S and 1-N, on which the swing spans will pivot, are concrete cylinders 44 feet in diameter and 99 feet high above the top of the caissons. Of this length 40 feet will be under water. They are built with a 3-foot-thick outside ring or wall, with two other 3-foot walls crossing the interior at right angles. Machinery for operating the swing spans will be housed in these massive piers.

Other Piers

Piers 2-N, 3-N, 2-S, and 3-S range from 32 to 44 feet in height above the water. They are 35 feet wide x 11.6 feet thick at the bottom, and reduce to 6.5 feet thick at the top. Piers 4-S and 4-N have footings 42 x 33 feet supported on 100 timber bearing piles. They are built within steel sheet cofferdams driven with a McKiernan-Terry No. 7 hammer. The sheeting was spliced together with plates, and after the piers were finished the bolts were cut to permit the removal of the upper sections of the piles. The lower half of the sheeting was left in place.

The top of pier 4-N footing is at minus 9 elevation and 4-S is at minus 12. From this grade the shafts of the piers go up to elevation 26.5. At the tops, the shafts are 4½ feet thick x 35 feet wide.

In constructing the land approach piers on the north shore, the transit mixers crossed over on the ferry with their loads of concrete from the batch plant. The crossing took about 7

minutes.

For unwatering purposes the contractor had 11 pumps of various makes on the job, ranging in size from 1½ to 8-inch.

Steel Erection

The Virginia Bridge Co. was expected to begin steel erection over the land piers last fall, although the river piers are not scheduled for completion until October, 1951. The bridge will have a clear 26-foot roadway with two safety walks for pedestrians, connecting the upper Tidewater country of the state with the Peninsula.

Major items of materials in the project include nearly 50,000 cubic yards of concrete, 11,000 tons of structural steel, and 1,250 tons of reinforcing steel. River excavation totals about 47,000 cubic yards. The bridge, which will be a toll structure, is being built under the Virginia Revenue Bond Act of 1940, covering construction or acquisition of major transportation facilities within the Old Dominion.



C. & E. M. Photo
On caisson 1-N, T. F. Loughborough, Construction Engineer for the Virginia Department of Highways; Roger Stevenson, Resident Engineer for the engineer-consultants, and Thomas Kinter, Field Engineer for the contractors.

Personnel

The Massman Construction Co. and the Kansas City Bridge Co. employed an average force of 190 on its substructure contract, working a single day shift, with a small crew of from 20 to 30 on the night shift to set forms, clean up, and sundry work. Supervisory personnel included George Adgate, Project Manager; John Kuhn, Field Superintendent; and Thomas Kinter, Field Engineer.

Roger Stevenson is Resident Engineer, with J. C. Whiteman and S. L. Johnson Assistant Resident Engineers, for the consultants—Parsons, Brinckerhoff, Hall & Macdonald.

The Virginia Department of Highways' Chief Engineer is C. S. Mullen. T. F. Loughborough is Construction Engineer, and William R. Glidden is Bridge Engineer.

"It is the duty of every man to protect himself and those associated with him from accidents which may result in injury or death."—A. Lincoln

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AMSCO® Hardfacing!



Post Hole Digger now digs 206 holes in rocky soil before repointing

Just 4 holes was the former life of a new point and blade on this power-driven post hole digger. After hardfacing with AMSCO Tube Tungstite, the same blade and point dug 206 holes—51 times the former service!

Here's another example of big savings with AMSCO Hardfacing . . .

Lips and teeth of this dipper were given far greater resistance to impact and abrasion with AMSCO Economy Hardface . . . resulting in longer dipper life, lower handling costs per ton.

These are typical examples of tremendous savings made with AMSCO Hardfacing . . . savings in time, maintenance and money! Wherever any kind of part—from huge mining dippers to small drill bits—is subjected to impact or abrasion, you'll find that it pays to hardface with AMSCO Welding Products.

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WELDING PRODUCTS

Where to look for money-saving hardfacing applications:

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Earthmoving Equipment • Farm Equipment
Oil Field Drill Bits • Sprockets • Dredge
Pump Shells • Materials Handling Equipment • Pulverizer Hammers • Punching, Trimming, Forging Dies • Coal Cutter Bits.



NEW, WHITE HALF TRACKS

Originally cost gov't \$7,000. Now priced at such a very small fraction of that figure. With International K11 motor, 4-speed trans. with auxiliary 2-speed shift and super power low speed drive. Hydraulic brakes, 900-20 tires. Excellent for logging, skidding, construction work, house moving, dump work. Available with or without winches. We carry a full line of replacement parts.

Millions of G. I. Truck Parts
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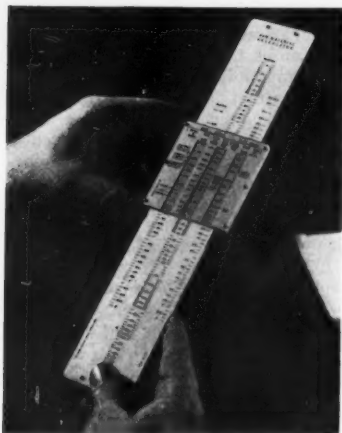
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This new slide-rule calculator computes information needed for metal rod and flat stock in various shapes and sizes.

Bar-Stock Calculator For Steel Estimates

Metal rod and flat-stock requirements can be determined directly from blueprints or a sample piece of metal with a new slide-rule type of calculator made by H. R. Potter Co., P. O. Box 318, Montclair, N. J. The instrument is made of Vinylite plastic rigid sheet which is said to have exceptional dimensional stability, and resistance to moisture, grease, oil, ink, etc. All markings on the calculator are covered with a transparent piece of the same material to prevent wear.

The 2 x 11-inch device computes information needed for rod and flat stock in various shapes and sizes and in any length. With a single setting, rod-stock diameters of 1/8 to 3 inches, made of bronze, brass, steel, and aluminum, in square, hexagonal, and round shapes may be calculated. Larger diameters are determined by multiplication. Copper, brass, steel, and aluminum flat stock, 0.003 to 3 inches thick in any length or width, are also provided for. The slide is set with the correct rod size or flat-stock thickness on a line with the type and shape of metal being figured. Pounds of stock required per thousand pieces for the length of piece needed may then be read directly from the rule.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 273.

New Impact Wrench

A new Thor 5/8-inch Silver Line electric impact wrench for heavy-duty nut-setting jobs has been announced by Independent Pneumatic Tool Co., 175 State St., Aurora, Ill.

Operating at 2,000 rpm, the wrench will deliver 1,850 impact blows per minute both forward and reverse. Weighing slightly over 12 pounds and measuring 11 3/4 inches overall, the new tool is equipped with a detachable dead handle for easier handling. It has a 5/8-inch square spindle and will drive machine screws up to 5/8 inch and wood screws up to No. 22.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 323.

Bin-Level Indicator

A 19-page catalog describing various bin-level indicators for use with all bulk materials has been issued by The Bin-Dicator Co., 13946 Kercheval, Detroit 15, Mich. These indicators are designed for automatic control of machinery in response to fluctuating levels of material in silos, bins, hoppers, chutes, pipes, and conveyor boxes. Application in the construction field is for cement, sand, and gravel-storage bins.

The booklet explains typical applications of the Bin-Dicators and how they work. A complete description, with

engineering drawings of the operating mechanism, is given for each model. Specifications point out that these units may be mounted on the outside or inside of the wall in a vertical, horizontal, or intermediate-angle position. They may also be adapted for mounting on curved surfaces. A wiring diagram is included for both high-level and low-level signal systems.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 319.

Cline Heads Adams Division

E. L. Cline is now Western Division Sales Manager for the J. D. Adams Mfg. Co., Indianapolis, Ind. He has charge of all sales in the states west of the Mississippi, the state of Wisconsin, the upper peninsula of Michigan, and a part of Illinois. Mr. Cline joined Adams in 1926 and before his promotion he was District Manager in charge of sales in Texas, Louisiana, Arkansas, Missouri, Kansas, and Oklahoma.

Portable Belt Conveyor

The new 8-page Bulletin 374 issued by Barber-Greene Co., Aurora, Ill., describes the complete range of the Barber-Greene Model 374 heavy-duty portable belt conveyor. It lists the fields of use and products handled. These include sand, cinders, stone, and scrap at rates of feed up to 425 tons per hour. A series of sketches show appli-

cations in industry and construction. Accessories such as feeders, screens, hoppers, and spouts are pictured, and possible uses described. Construction features are illustrated. The B-G 374 is available in lengths from 33 to 60 feet and belt widths of 18, 24, and 30 inches.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 387.

STA-VIS STARTING FLUID

AUXILIARY FUEL FOR QUICK STARTING OF DIESEL ENGINES

- Prolongs battery life
- Sure fire starts
- Saves time and money
- Economical—price reduced

LARGE 24-OUNCE CAN ONLY \$1.20

25-can case shipped prepaid

Distributor Territories Open—Write for information

STA-VIS OIL COMPANY. St. Paul 2, Minn.



TRAXCAVATOR *handles 'em in stride*

► "Upstairs", this T7 TRAXCAVATOR hustles, to dig and move 100,000 cubic yards of overburden (including considerable hard clay) from a mile-long, 30-foot highwall. Next, the big T7 romps down a steep ramp to clean a 2-foot layer of dirt, 400 feet wide and a mile long from the quarry base. Tough stripping excavation service is only the beginning of this powerful tractor shovel's job.

At the quarry face the TRAXCAVATOR uses full traction-backed horsepower of the "Caterpillar" D7 Tractor to crowd its bucket full of shot rock after each blast. Its 6.0 M.P.H. fifth speed, to sprint all over the job carrying full buckets of heavy material, emphasizes that TRAXCAVATORS capably replace and "run rings around" several limited-duty machines.

While "resting", this able machine stockpiles crushed rock for Latrobe Construction Co., Latrobe, Pennsylvania. "If I didn't have this TRAXCAVATOR unit, I couldn't keep this quarry working profitably," declares Quarry Sup't. H. A. Harr.

From heavily-reinforced bucket and armored heavy-duty V-Belt drive to sturdy structural steel frame, the T7 TRAXCAVATOR is built for big capacity performance on big, tough jobs. Whether your work calls for stripping, excavating, loading of shot rock or loose materials, TRAXCAVATORS can help you hit production peaks at new low costs.

For complete information on TRAXCAVATORS, contact your TRACKSON—"Caterpillar" Dealer, or write direct to TRACKSON COMPANY, Dept. CE-11, Milwaukee 1, Wisconsin.

TRAXCAVATOR®

*The Original
Tractor Excavator*

Convention Calendar

January 28-February 1—AED Meeting

Annual Meeting, Associated Equipment Distributors, Stevens Hotel, Chicago, Ill. P. D. Hermann, Executive Secretary, AED, 360 N. Michigan Ave., Chicago 1, Ill.

February 5-7—Asphalt-Paving Men

Annual Meeting, Association of Asphalt Paving Technologists, Hotel Cosmopolitan, Denver, Colo. Ward K. Parr, Executive Secretary, 1224 E. Engg. Bldg., Ann Arbor, Mich.

February 11-15—National Ready Mixed Concrete Association and National Sand & Gravel Association

Twenty-First Annual Convention, National Ready Mixed Concrete Association, and Thirty-Fifth Annual Convention, National Sand & Gravel Association, The Roosevelt Hotel, New Orleans, La. V. P. Ahearn, Executive Secretary, 1325 E St., N. W., Washington 4, D. C.

February 20-22—Illinois Highway Conference

Annual Conference on Highway Engineering, University of Illinois, Urbana, Ill. W. S. Pollard, Jr., Highway Conference Committee, University of Illinois, Department of Civil Engineering, Urbana, Ill.

February 26-March 1—AGC Meeting

Annual Convention, Associated General Contractors of America, Statler Hotel, Boston, Mass. H. E. Foreman, Managing Director, Munsey Bldg., Washington 4, D. C.

March 5-9—ASTM Meeting

Spring Meeting and Committee Week, American Society for Testing Materials, Netherland Plaza Hotel, Cincinnati, Ohio. C. L. Warwick, Executive Secretary, 1916 Race St., Philadelphia 3, Pa.

March 12-14—ARBA Meeting

Annual Meeting, American Road Builders' Association, Schroeder Hotel, Milwaukee, Wis. Lt. Gen. Eugene Reybold, Executive Vice President, International Bldg., Washington 4, D. C.

March 26-29—Purdue Road School

Thirty-Seventh Annual Purdue Road School, Purdue University, Lafayette, Ind. Prof. Ben H. Petty, School of Civil Engineering, Purdue University, Lafayette, Ind.

March 28-30—N. Y. Highway Engineers

Annual Convention, New York State Association of Highway Engineers, Rochester, N. Y. William H. Saunders, Convention Secretary, P. O. Box 72, Rochester, N. Y.

April 30-May 4—Materials Handling

National Materials Handling Exposition and Conference, American Materials Handling Society and Material Handling Institute, International Amphitheatre, Chicago, Ill. Clapp & Poliak, Inc., 341 Madison Ave., New York 17, N. Y.

Column-Type Foundations Anchored in Rock Sockets

An 8-page folder on its system of foundation columns anchored in rock sockets has been prepared by the Drilled-In Caisson Corp., 2 Park Ave., New York 16, N. Y. It explains and illustrates this type of foundation, method of installation, and results that can be obtained. It points out that with this system the entire load in the shaft above rock level is transferred to sound bedrock through four actions: a bearing of the steel shell on the rock, bearing of the steel core on the rock, bearing of a concrete core on the rock, and the friction and bond of the concrete filling on the wall of the socket.

The brochure explains that Drilled-In Caissons provide a number of features: heavy column loads can be carried on a single caisson and these loads may be compressive, tensile, or bending; any type of soil may be penetrated; and rock at any depth can be reached. With this system, examination of the rock is possible. Mechanical digging methods without compressed air eliminate hazards to workmen, and confined space is seldom an obstacle, the company says. This system has been used for loads up to 1,700 tons on a single caisson. The booklet covers specifications, results of load and bond tests, and engineering services offered by the company.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 307.

Composite-Deck Bridges

A new 4-page circular about composite-deck bridges has been prepared by Timber Structures, Inc., P.O. Box 3782, Portland 8, Oreg. It states that the composite-deck bridge will provide the serviceability of an ordinary bridge at 20 per cent less cost.

The folder describes the construction of a composite-deck bridge—a deck composed of laminated panels connected by spiral dowels, over which a 4½-inch concrete roadway is poured. The roadway may also be asphalt paving if desired, in which case the timber portion is not designed as a composite deck.

The folder points out that construction time is reduced, since the units of

the composite-deck bridge are delivered to the job site completely fabricated and ready for installation and no slab forms are required. Detailed drawings are provided, plus complete information on the construction and installation of these units.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 381.

Gurley Advances Higbee

Lester C. Higbee is now Director of Engineering for W. & L. E. Gurley, Troy, N. Y., manufacturer of engineering and surveying instruments. Mr. Higbee, who was recently elected Secretary of the company, will continue as Sales Manager.

State Highway Dept. Makes Report to Citizens

As part of its program of public relations, the Pennsylvania Highway Department has released a report on its activities, addressed to "Fellow Pennsylvanians". The report contains a graph showing the annual expenditure of the Department in the years since 1929, and a map showing areas which have been under construction during the last four record-breaking years. The report also contains pertinent information on local aid, Federal aid, maintenance ratings, etc.

Copies may be obtained free from the Bureau of Public Relations, Pennsylvania Department of Highways, Room 514, North Office Bldg., Harrisburg, Pa.

MAKE MORE Profit ON EVERY CONCRETE CONSTRUCTION JOB

USE THE

BLAW-KNOX

"Complete Package"

FOR LOW COST CONSTRUCTION OF:

- Concrete Roads
- Airport Runways
- Curb and Gutter Work
- General Concrete Projects
- Ready-Mix Operations

Concrete Buckets, Truck Mixer Loading Plants, Paving Spreader, Bulk Cement Plants, Finishing Machines, Road Forms, Steel Street Forms, Precision Subgraders, Truck Mixers, Aggregate Batching Plants, Clamshell Buckets.

WHETHER your job calls for building a turnpike or paving main street—use the low cost, assembly-line efficiency of the Blaw-Knox "Complete Package" of balanced construction equipment. It contains everything you need . . . from handling material to finishing the slab . . . for the lower cost operation that comes with modern mechanization methods.

Your Blaw-Knox distributor can help you make 1951 your busiest, most profitable year. Call on him today for "Complete Package" details.

BLAW-KNOX

Division of Blaw-Knox Company
Farmers Bank Bldg., Pittsburgh 22, Pa.

New York • Chicago • Philadelphia • Birmingham • Washington • San Francisco

Distributor Doings

Gavel to Pass From Clint Halladay To Ray Arnold at End of This Month

★ WHEN the Associated Equipment Distributors meet for the thirty-second time, on the 28th of this month in Chicago, all eyes will be focused on two men—Clint Halladay and Ray Arnold, 1950 and 1951 AED Presidents.

You know them both well, but there's no time like the first month of a new year for taking stock of your assets.

Halladay

National presidents of Associated Equipment Distributors are usually men with a sweeping background in construction machinery, and the present head of AED—Clint Halladay of Sioux Falls, S. Dak.—is definitely no exception.

Since he graduated in 1914 from South Dakota State College with a degree in civil engineering, Halladay has followed construction all the way. His recent travels for AED closely parallel his early wanderings as a construction superintendent for such well known contracting organizations as General Concrete Construction Co. of Chicago,



C. & E. M. Photo
Clint Halladay, President of the AED and President of Halladay-Dettman Co. of Sioux Falls, S. Dak., at an AED regional meeting in Boston last fall.



The Halladay-Dettman Co. building in Sioux Falls, S. Dak.

and the Rust Engineering Co. of Pittsburgh. In 1920 he returned to South Dakota to become one of the State Highway Department's first resident engineers in a road-building program just getting under way.

After constructing state roads for five years he switched to county work, serving as Highway Superintendent for McCook County, and later for Lincoln County. In 1935 Halladay got into the distribution end of construction equip-



The plant of Arnold Machinery Co. Inc., and a subsidiary, Tractor-Implement, Inc., in Salt Lake City. Raymond L. Arnold heads Arnold Machinery.

ment when he took the post of Assistant General Manager with Western Materials Co. of Sioux Falls. Incidentally, the top man then with Western Materials was E. K. Hurst, a former President of AED. When Hurst died in 1941, the firm name was changed to Halladay-Dettman Co. with Halladay as President and General Manager.

Now 58, the thick-waisted, friendly Halladay has always taken a keen interest in AED. He has been Vice President and Regional Director of Region 8 which includes the states of Minnesota, North Dakota, and South Dakota. In 1949 he reached the national post of Executive Vice President, and in 1950 he was elected President of AED.

Arnold

Raymond L. Arnold, President and General Manager of Arnold Machinery Co., Inc., Salt Lake City, Utah, and nominee for 1951 President of the Associated Equipment Distributors, is the son of L. E. Arnold, one of the four incorporators of the Arnold Machinery Co. He graduated from Knox College, Galesburg, Ill., in 1929 with a Bachelor of Science degree, and after spending some time in Europe he joined the Arnold Machinery Co. in 1930. During



R. L. Arnold, President of the Arnold Machinery Co., Inc., Salt Lake City, is slated for 1951 President of AED.

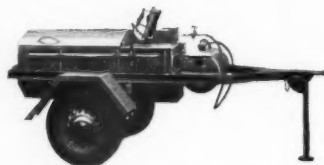
the next few years he worked in the parts department, warehouse, shop, and office. In 1934 he became a director and the Treasurer of the company; in 1940 he was made Vice President and General Manager; and in 1945, when his father retired, he became President.

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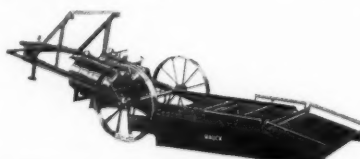
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**HEATING
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Speed-Master Melting Kettle for tar, asphalt, pitch, 40 to 165 gal. sizes. Available also with hand or power spray attachments for applying bitumen under pressure.



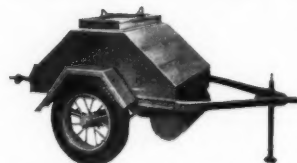
Surface Heater—Fold-over type for easy transportation. 4 hood or pan sizes.



Double Kerosene Burner Equipment on wheels for quick, portable service anywhere.



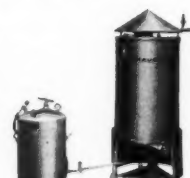
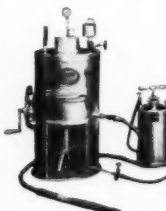
Superheated Steam Thawer with injector pump, for thawing hydrants and culverts.



Tool and Asphalt Heater with 3 kerosene burners. Furnished with or without binder cement kettle.



Melting Furnaces for jointing compounds; also lead melting furnaces.



Water Heater heats up to 1600 gal. water per hour for concrete heaters and central mixing plants.

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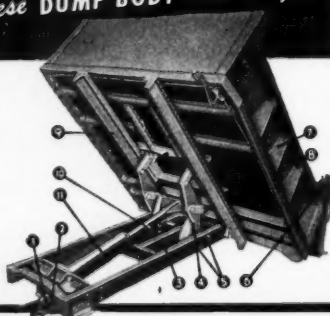
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ANTHONY "Super" HOISTS**
give you all these DUMP BODY advantages!

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THEY ARE PRICED
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These and 10 additional
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SEE YOUR TRUCK DEALER HE HAS
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1. "Non-thrust" Roller Bearing Pump patented design stops pump troubles.
2. "Balanced" Piston type control valve non binding, free action, creep proof.
3. Double "T" members supports lift mechanism—protects truck frame.
4. Double Arm "Power-Speed" Hoist—Super Power leverages changing to speed for faster dumping cycle.
5. Double shafts stabilizes lift, permits flexibility, adds life to hoist frame.
6. Massive rear body braces greater strength.
7. 3 Pyramid Braces on sides supports larger area.
8. Body rolls 3 1/2" wide—will stand a terrific beating.
9. Telescopic tipping frame gives full structural strength with 2' lower mounting height.
10. Extra large Piston Shaft gives added protection and strength needed for "Spreading" operations.
11. Cylinder, seamless steel, fitted with blow-out Proof Cylinder head.

The value of your Anthony Distributor can't be measured merely by the money he saves you—Call him for prices, delivery and service on Dump Bodies, Hoists, Lift Gates, Material Spreaders and other truck equipment.



ANTHONY COMPANY • Streator, Illinois

Arnold faced the problems of a new company—accumulating lines and establishing a reputation—during the depression years. But by 1938 the firm had succeeded in finding a place in the industry and has seen its greatest growth since 1940. In that year the company had twelve employees. Now, with its subsidiaries Tractor-Implement and Interstate Tractor Sales, it has seventy-two. Tractor-Implement, Inc., was formed in 1945 to handle the distribution of the Ford-Ferguson tractor, and Interstate Tractor Sales, Inc., was formed in 1948 as a result of the expansion of the farm-machinery business into a Denver distributorship. It is a Colorado corporation.

Arnold Machinery Co. and Tractor-Implement, Inc., own and occupy a property of 53,000 square feet in the wholesale district of Salt Lake City. Arnold Machinery Co. supports either in whole or in part a pension plan, an insurance-sharing plan, and a hospital and surgical plan. Most of the employees are stockholders in the company, as this has been a principle of the management from the beginning.

Of the four original incorporators, three are still connected with the company: L. E. Arnold is Chairman of the Board, J. W. Plant is Vice President, and J. E. Gatherum is Credit Manager. Other officers are R. G. Arnold, Treasurer and Sales Manager; R. S. Pond, Secretary; and A. D. Byerline, Vice President and General Manager of Tractor-Implement, Inc.

Former President of AED Warns Against Overextended Inventories

Two things a good equipment distributor cannot afford are panic buying and overextended inventories.

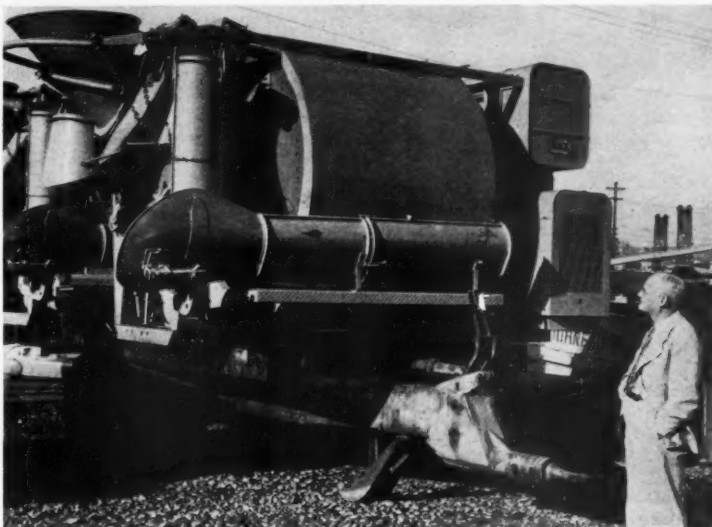
That is the opinion of A. F. Sersanous, President of Loggers & Contractors Machinery Co. of Portland, Oreg., and Past-President of the Associated Equipment Distributors.

"We are not pressuring the manufacturers we represent into unrealistic deliveries," Sersanous said. "If the current foreign situation is as bad as it appears—and I believe it is—the wisest possible course for the equipment distributor is to work along within the limits of such priorities as may be set up."

With that policy in mind, Loggers & Contractors Machinery Co. has on its floor only a normal supply of equipment. The one exception is spare parts. In order to keep contractor's and logger's equipment running during whatever times may lie ahead, Sersanous has increased the spare-parts inventory to a modest extent.

In the face of opinion contrary to his policy, Sersanous points out what happened to automobile dealers who let their inventories mushroom, particularly in the used-car department. "Exactly the same thing could happen to an equipment distributor," he warns, summing up his policy by explaining that only middle-of-the-road policies and sensible, normal buying will make the equipment supply go around where it is needed.

Equipment distributors are being represented ably in Washington, D. C., by Carroll F. Winchester, Sersanous says, and the policymakers in the na-



C. & E. M. Photo
A. G. Sersanous doesn't believe in slugging his yard with too much new equipment, but this new Rex Motomixer gets his attention because Rex is one of his oldest accounts.

tion's capital now know and appreciate the vital role the distributor plays in national construction.

Loggers & Contractors Machinery Co., of which Sersanous is head, is one of the major equipment distribution firms in the Pacific northwest. As its name implies, it caters to both loggers and contractors. The firm has been in business for 42 years, and represents many of the leading construction-machinery manufacturers of the industry.

Officials Congratulate Dealer

Several top officials of the International Harvester Co. flew to Portland, Oreg., from Chicago recently to congratulate the Howard-Cooper Corp. on the sale of 100 of the company's giant crawler tractors during 1950. The 100th tractor was purchased by Harold Woolley, President and owner of the Woolley Logging Co., Drain, Oreg.

Officers and officials of International Harvester who participated in the spe-

(Continued on next page)



Bethlehem Hinged-Bar Mats in place over first course, with the paving equipment on the job. These hinged-bar mats fold over double, are easy to install.



J. M. Montgomery (left), superintendent, and Bill Mann, general manager for F. D. Kessler, Inc.

Road Relocation in Northeastern Pennsylvania

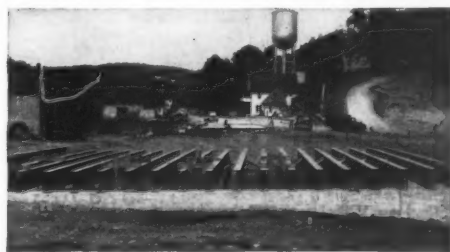
U. S. Route 11, between Hopbottom and Nicholson, Pa., north of Scranton, was the recent scene of a road improvement project authorized by the Pennsylvania Department of Highways. The project called for the relocation of some 34,000 ft of two-lane highway, and included the erection of a bridge and an overpass. Contractor: F. D. Kessler, Inc., Northumberland, Pa. Bethlehem furnished reinforcing bars, structural steel, bar mats and dowel units.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation, Export Distributor: Bethlehem Steel Export Corporation

STEEL FOR HIGHWAYS

Dowel Units • Reinforcing Bars • Bar Mats • Guard Rail
Guard Rail Posts • Wire Rope and Strand • Pipe
Hollow Drill Steel • Spikes • Bolts and Nuts
Timber Bridge Hardware • Tie-Rods
Sheet- and H-Piling • Fabricated Structural Steel



Showing Bethlehem structural shapes in place in new bridge. Normal traffic using the old Route 11 is obliged to start detour in vicinity of water tower.



Two men can place Bethlehem Dowel Unit quickly and easily. Unit is designed to minimize the severe load-transfer problems caused by heavy wheel loads.



Truck-mounted post-driving machine drives Bethlehem Steel Posts firm and true. Steel posts make ideal supports for cable or Safety-Beam guard rail.

Use the ...
PORTABLE SHELTON PUMP
"You See When Tank Is Full"

- ★ Pumps 15 gallons per minute
- ★ Primes itself
- ★ Lifts Gasoline 15 feet
- ★ LONG LIFE (No Leathers)
- ★ Strains Fuel through Replaceable Strainer

CUSENBARY SALES CO.
CUNNINGHAM KANSAS

Distributor Doings

(Continued from preceding page)

cial ceremonies honoring the Howard-Cooper Corp., included T. B. Hale, Vice President, general sales; A. J. Peterson, General Sales Manager; I. P. Payne, Assistant Sales Manager, Industrial Power; M. F. Peckels, Manager, Consumer Relations Department; and Jack Bess, Assistant Regional Manager, Industrial Power (western region). H. W. Berry, Harvester's General Sales District Manager at Portland, was also present for the occasion.

Howard-Cooper officials participating in the ceremonies included Frank Cooper, President; William Wiley, Vice President; and Frank Parker, General Sales Manager.

New Division for Western

Western Machinery & Engine Co. of 5075 Manchester Ave., St. Louis, Mo., and 125 E. McCord St. in Centralia, Ill., has formed a Construction Equipment Division to handle the sales and service of contracting and industrial equipment in eastern Missouri, southern Illinois, and western Kentucky. John H. Heintz, formerly with Leyman Mfg. Corp. in Cincinnati, will manage the new division.

Western Machinery was organized in 1929 and now handles General Motors diesel engines, Packard marine engines, Le Roi gas engines, Louis Allis motors, Longyear mining equipment, etc. It is adding new accounts to provide a full line of construction and industrial equipment and engineered mechanical installations. Complete sales and service staffs are maintained at both offices.

Caterpillar Allocation Program

The Caterpillar Tractor Co., Peoria, Ill., has put into effect a voluntary allocation program designed to distribute equitably its heavy machinery among its world-wide dealer organization. At present the plan applies only to track-type tractors, cable controls, bulldozers, and motor graders. Based on experience gained during World War II and for four years thereafter, the plan has been accepted by dealers as the best mode of distribution under present market conditions.

HINGED PLATEGRIP BELT FASTENER No. 500 FOR HEAVY CONVEYOR BELTS OF CHANGING LENGTH

These heavy-duty belt fasteners make a strong, flexible joint in conveyor belts, belts of any width and of from $\frac{3}{8}$ " to $\frac{1}{2}$ " thickness. They offer special advantages in mines, quarries or industrial setups where length or position of belt is frequently changed, because sections can be removed or added at will. Joints are opened for this purpose by simply pulling out the hinge pin.

Easily and quickly applied on the job or in the shop. Special design gives deep compression into belting and smooth, flush joint.

Write for Circular.



ARMSTRONG-BRAY & CO.
5382 Northwest Highway CHICAGO 30, U. S. A.



Harold Woolley, President and owner of the Woolley Logging Co., Drain, Oreg., (third from left), hands a check to Frank Cooper, President of Howard-Cooper Corp., for the purchase of the 100th International TD-24 crawler tractor sold by the Portland industrial distributor during 1950. Other I-H and H-C officials witness the sale.

Vibrator Company Wants Dealers

Dealers, if you are interested in carrying vibratory equipment, contact Vibro-Plus Products, Inc., 54-11 Queens Blvd., Woodside, Long Island, N. Y. This company, which makes gasoline, electric, and pneumatically operated Roll-gear internal vibrators, electrically operated Topdog vibrators, and Terrapac soil compactors, has several exclusive dealerships available.

Mr. Eric Fridh, Vice President of Vibro-Plus, will be on hand at the Associated Equipment Distributors Convention in Chicago with demonstrations and exhibits, and will welcome all dealer inquiries.

Five dealers recently appointed to handle the Vibro-Plus line on an exclusive territory basis are: Yancey Bros. Co., Atlanta, Ga.; Portable Equipment Co., Chicago, Ill.; R. E. Brooks Co., Hasbrouck Heights, N. J.; W. I. Clark Co., New Haven, Conn.; and George P. Williams Co., Cleveland, Ohio.

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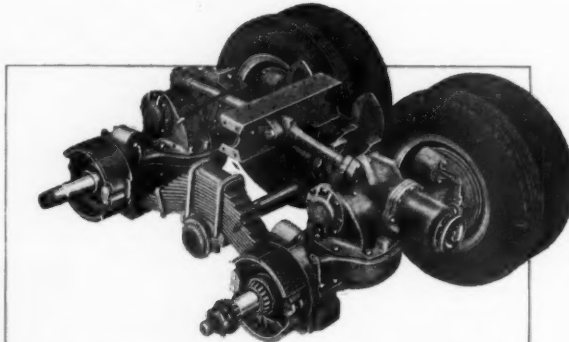
MACKS make light of heavy loads . . .

Big Mack super-duty trucks make the hard jobs look easy...because in design and construction they incorporate numerous outstanding features that contribute to easy maneuverability, ease of control and positive traction regardless of terrain.

Powerful Diesel Engines! Hydraulic Power Steering! Air Assist Clutch! Flexible Rubber Shock Insulators! Mack's famed Balanced Bogie and Power

Divider. All are Mack features that assure power and strength for the heaviest loads; flotation and traction for the most slippery mud or sand.

Your nearest Mack branch or distributor will give you the full story on what Macks can do for you in trouble-free, uninterrupted schedules... greater profits through greater output at lower cost. You'll find it's a story well worth hearing.

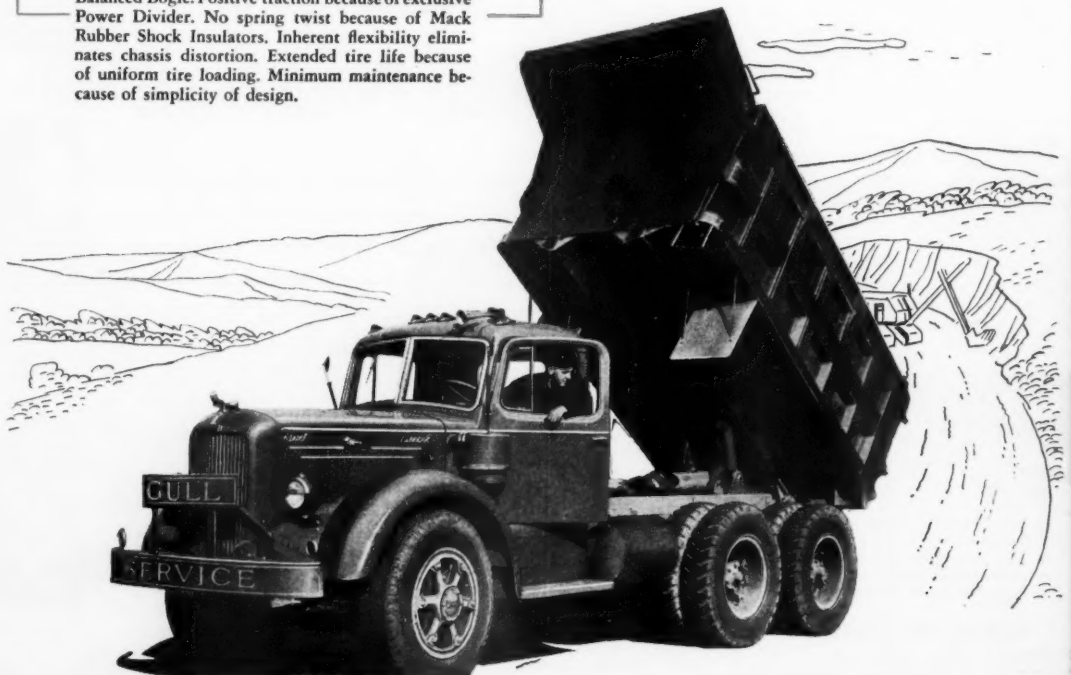


Only Mack gives you all the advantages of the famed Balanced Bogie. Positive traction because of exclusive Power Divider. No spring twist because of Mack Rubber Shock Insulators. Inherent flexibility eliminates chassis distortion. Extended tire life because of uniform tire loading. Minimum maintenance because of simplicity of design.



...outlast them all

Mack Trucks, Empire State Bldg., New York 1, New York; Factories at Allentown, Pa.; Plainfield, N. J.; Long Island City, N. Y. Factory branches and distributors in all principal cities for service and parts. In Canada: Mack Trucks of Canada, Ltd.



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Highway Chief Joins N. Dak. Dealer

N. O. Jones, who resigned on December 31 as North Dakota State Highway Commissioner, has joined the executive staff of Northwestern Equipment, Inc., construction-equipment distributor of Fargo, N. Dak. He is Assistant to the President.

For 19 years prior to his appointment as Commissioner, Mr. Jones served in an engineering capacity with a midwest public utility company. For 8 years he was Superintendent and Chief Engineer of the Ottetail Power Co.'s Wahpeton, N. Dak., plant. He became North Dakota's highway chief in 1945.

New Line, New Salesman for Herd

Herd Equipment Co., Oklahoma City, Okla., has been granted an exclusive state franchise by the Gardner-Denver Co., Quincy, Ill. Herd will handle the company's line of portable and stationary air compressors, paving breakers, clay diggers, backfill tampers, wagon drills, hand-held drills, drill rods, air hose, and allied accessories.

Ed Mitchell is now sales representative for Herd in south-central Oklahoma. He replaces Dillon Gamble.

Dealer on RFC Advisory Committee

The Board of Directors of the Reconstruction Finance Corp. has appointed Lon M. Rish of Bluefield, W. Va., to the advisory committee of the corporation's loan agency at Richmond, Va. Mr. Rish is President of the Rish Equipment Co., which has branches at Charleston, Clarksburg, Bluefield, Richmond, Roanoke, and Cincinnati. He also heads four wholesale distributor organizations headquartered in Bluefield.

Shed Manages Rupp Department

Joseph L. Shed has been appointed Outside Rental Manager of the Buffalo office of Rupp Equipment Co. He has been with Rupp since 1940.

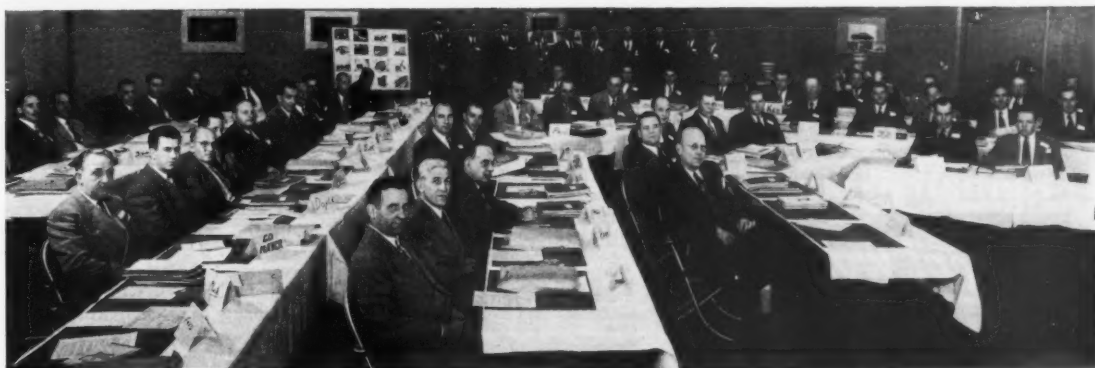
To Serve Grader and Roller Co.

The Standard Equipment & Supply Co. of Little Rock, Ark., has accepted a distributorship for the W. A. Riddell Corp. and is prepared to give complete service to customers.

Roger E. Newell, newly appointed District Representative for Riddell, is handling all phases of distributor sales and service on Warco motor graders and Hercules road rollers in the New England states, New York, New Jersey, and Pennsylvania.

Named by Onan in Georgia

Southern Meter & Transformer Co. of Atlanta has been appointed Georgia distributor of D. W. Onan & Sons, Inc. generating equipment. G. A. Power, Service Manager of Southern, has been attending the factory-supervised training course at Onan's Minneapolis office. G. W. McIntosh is President of the distributor company and R. Allen is Secretary and Treasurer.



Fifty-one dealers and their key men attended a conference sponsored by the Industrial Engine Division of the Chrysler Corp. in Detroit. Service matters and engine adaptation came in for a lot of attention.

Chrysler Dealer Conference

Fifty-one dealers and key men in their organizations attended a 4-day conference held by the Industrial Engine Division of Chrysler Corp. in Detroit late last October. Meetings

were held in the auditorium of the administration building of the Chrysler Jefferson plant.

The meeting might be termed a clinic in which every phase of selling and servicing Chrysler industrial engines

was discussed. The visiting dealers asked questions freely. Service matters were extensively gone over and engine adaptation occupied most of two days. The group inspected the manufacturing

(Concluded on next page)

2 EASY STEPS TO MODERN PAVING REPAIR

SAVE TIME . . . SAVE LABOR . . . REDUCE MAINTENANCE COSTS

CUT YOUR CONCRETE WITHOUT SPALLING

with the *Tri-Line* Concrete Cutter

Outline the area to be removed. Then start cutting . . . cleanly . . . without spalling. You use just one machine . . . one unskilled operator.

And Tri-Line's double-bonded blades cut twice as fast . . . at half the cost . . . to depths of 6½ inches! **FOR CONTRACTION JOINT CONSTRUCTION**—Tri-Line concrete cutting is unequalled. It provides permanent, precision joints—controlled to your specifications—cheaper, better—with no spalling—no after-maintenance.



GET COMPLETE FACTS ON THESE OUTSTANDING TRI-LINE FEATURES

- One-man, three-wheel steerable design
- Long blade life—no bind or pinch
- Direct-acting hydraulic control
- Powerful gasoline engine drive
- Electric motor drive (optional)

Tri-Line

CONCRETE CUTTERS

are manufactured by

TRI-LINE CO.

931 Carroll Street

RACINE, WIS.

CITIES, COUNTIES, STATES AND PRIVATE CONTRACTORS USE TRI-LINE CUTTING FOR:

- Street and highway maintenance
- Sewer, water, or gas main construction
- Electric conduit installation for street lighting
- Industrial plant maintenance—machinery installation

COMPLETE

the OPENING JOB

with the one-man

"Ottawa"

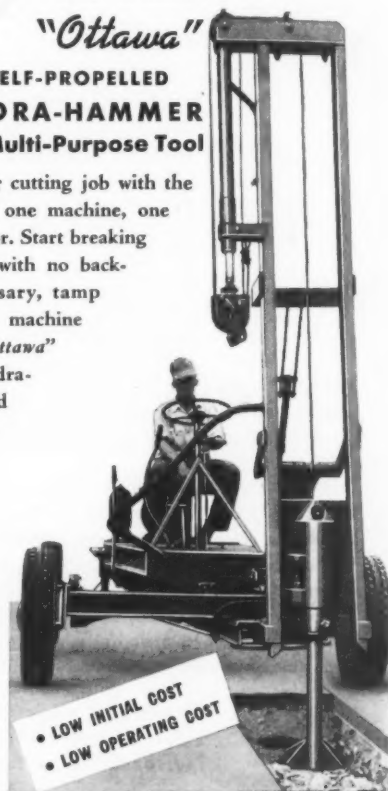
SELF-PROPELLED HYDRA-HAMMER (MPT) Multi-Purpose Tool

Follow your cutting job with the MPT. Again, one machine, one unskilled operator. Start breaking—easily, quickly—with no back-fracturing. If necessary, tamp backfill with the same machine . . . fast and easy! The "Ottawa" one-man, self-propelled Hydra-Hammer is hydraulically powered . . . completely self-contained . . . capable of performing many jobs . . . breaking concrete, tamping backfill, cutting asphalt.

The OTTAWA Self-Propelled MPT—

Moves quickly from job to job Requires no additional costly, cumbersome equipment Free-falling hammer design prevents any shock to operator or machine Controlled impact insures against water, gas, or sewer pipe damage Tamps—with better compaction—holes up to 4 feet wide, 10 feet deep.

The "Ottawa" SELF-PROPELLED HYDRA-HAMMER is manufactured by OTTAWA STEEL PRODUCTS, INC., OTTAWA, KAN.



- LOW INITIAL COST
- LOW OPERATING COST

YOU BE THE JUDGE . . .

Let us arrange a free demonstration of "Tri-Line" and "Ottawa" machines on your job. Write for catalogs, prices and name of nearest distributor.

HOOKS, TONGS GRIPS and SLINGS

HANDLE HEAVY
OBJECTS SAFELY!





A Downs "Grab" eases every contractor's pulling or handling job. Get Downs pile driving and pulling units, ripping hooks, beam tongs, slings and hooks for odd shaped objects. Write for illustrated catalog No. 200B.





DOWN'S CRANE & HOIST CO.
MECHANICAL ENGINEERS
340 W. VERNON AVENUE
LOS ANGELES 37, CALIF.

Electric Cranes • Hand Cranes • Jib Cranes • Sheaves • Sheave Blocks
Pile Hooks • Pile Hooks • Crane Trolley Hooks • Crane Hooks • Crane
End Truck Units • Jib Crane Fittings • Automatic Mechanical Load Brake
Crane Hook Blocks

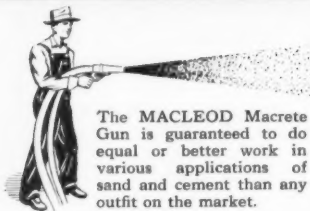
Alloy Steel Sling Chains

A folder describing alloy-steel chains and slings has been prepared by S. G. Taylor Chain Co., Box 509, Hammond, Ind. It offers detailed information and complete specifications on chains varying in size from 1/4 inch to 1 3/4 inches.

Spex are given for a variety of single, double, triple, and 4-leg slings. The folder includes definitions, cautions, and instructions governing the purchase and use of chains.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 263.

For Cement Work YOU CAN DO A BETTER JOB WITH A MACRETE Gun



The MACLEOD Macrete Gun is guaranteed to do equal or better work in various applications of sand and cement than any outfit on the market.

The process of blowing a mixture of hydrated sand and cement by compressed air through the MACRETE GUN has been used successfully and far more economically for repairing and restoring:

Concrete Roads
Foundries
Warehouses
Chimney Stacks
Silos
Sewers
Reservoirs
Dams
Structural Steelwork
Marine Piers

Coke Ovens
Mines
Factories
Water Tanks
Tunnels
Masonry
Irrigation Ditches
Bridges
Residences
Walls

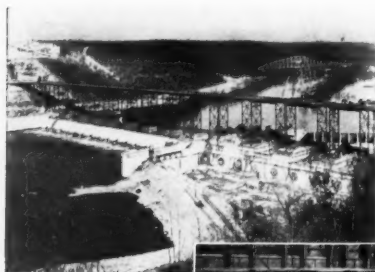
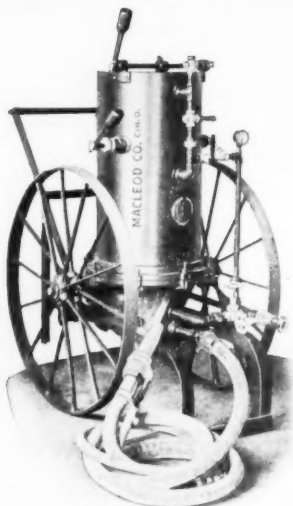
—and for scores of other uses.

For prices and descriptive literature write Dept. A.



The MACLEOD Company

2240 BOGEN ST. CINCINNATI 22, OHIO ESTABLISHED 1897



ON THE JOB

at the mammoth Bull Shoals Dam. Constructed by the Ozark Dam Constructors

under the supervision of the U. S. Corps of Engineers, Bull Shoals is one of the most massive concrete dams in the U.S. Concrete is at its best when cured with Fulco mats. They stay wetter longer, insulate against sudden temperature changes, increase curing efficiency and the subsequent flexural strength of the concrete. Sturdily made of tough cotton with stitched edges and seams, filled with high grade cotton padding, Fulco mats may be used over and over again, making the cost per job negligible. See your equipment dealer for prices or wire direct.

Fulton also manufactures sturdy, top quality Triple Strength Tarps, drop cloths, and tents. Indispensable protection at economical prices.

Fulton BAG & COTTON MILLS

Atlanta • St. Louis • Dallas • Denver • Kansas City, Kans. • Minneapolis
New Orleans • Los Angeles • New York, 434 Broadway • Winter Haven, Fla.

FULCO COTTON CONCRETE CURING MATS



Distributor Doings

(Continued from preceding page)

operations of the Division in the Chrysler plant and visited the laboratories of the Engineering Division at Highland Park.

There were two daily sessions Monday through Thursday, with J. C. Hammelef, Manager of the Industrial Engine Division, presiding, assisted by R. H. Westrick, Service Manager; C. H. Williams, Project Engineer; and all members of the field force. Robert T. Keller, President of the Division, headed the group of hosts. The program's grand finale was a banquet at a downtown hotel, with Mr. Hammelef acting as toastmaster. Mr. Keller was the principal speaker.

Wyeth-Scott Looks for Dealers

The Wyeth-Scott Co., Newark, Ohio, manufacturer of the More Power Puller, has several dealerships available and will be glad to hear from interested dealers.

Two distributors recently named by Wyeth-Scott are McKay's, Inc., of Wichita, Kans., with an exclusive distributorship in that state, and Contractors Equipment & Supply Co., of Albuquerque, N. Mex., with an exclusive in that state and 14 counties in northwestern Texas.

Forshoff at Syracuse Supply

Earle Forshoff is now Diesel Engineer Representative for Syracuse Supply Co., Syracuse, N. Y. Mr. Forshoff is a graduate of the U. S. Naval Academy and has been serving as an engineering officer in the Navy for the past three years.

Branch for Brandeis

Brandeis Machinery & Supply Co., Inc., Louisville, Ky., has opened a branch in Middlesboro to handle sales and servicing in southeastern Kentucky. Gil Liebert is Manager and Floyd Coombs is his assistant. Brandeis also has a branch in Evansville, Ind.

Coast Equipment Promotions

Paul R. Egli, formerly Assistant Manager of the Coast Equipment Co., San Francisco, has been appointed General Manager and will direct operations throughout the company's northern California sales area. A. J. Weibell has been promoted from Purchasing Agent to Assistant Manager.

Brown Is Capitol Vice President

Howard W. Brown has been elected Vice President of the Capitol Equipment Co., Inc., Harrisburg, Pa. Mr. Brown has been a sales representative with the firm since 1944.

The Pollution Problem

A pattern for intergovernmental and civic cooperative action on the problem of water pollution is set forth in the Public Health Service's Bulletin "Clean Water Is Everybody's Business".

The booklet describes the effect of water pollution and explains the steps in developing a comprehensive water-pollution control program. It urges the construction of treatment works, provisions for technical aid and research, the recovery and use of waste products, and the use of enforcement measures when necessary.

Single copies of this bulletin, Public Health Service Publication No. 11, are available without charge from the Public Health Service, Federal Security Agency, Washington, D. C. Copies may be obtained in quantity from the Superintendent of Documents, Government Printing Office, Washington, D. C., at 20 cents per copy.

1951 Officers for PCA

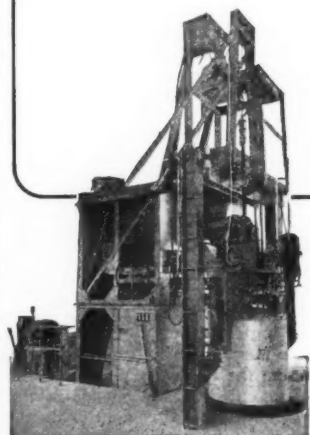
Smith W. Storey, President of the General Portland Cement Co. and the Consolidated Cement Corp., was elected Chairman of the Board of Directors of the Portland Cement Association at its annual meeting in Chicago. Mr. Storey succeeds Walter C. Russell, President of the Peerless Cement Corp., who has served as Chairman of the Board for the last two years.

Four new directors were also elected at the meeting. They are: Donald S. MacBride, President, Hercules Cement Corp.; F. A. Weibel, President, Valley Forge Cement Co.; Eugene D. Hill, President, Louisville Cement Co.; and Harold M. Scott, President, Keystone Cement Co.

New McGraw Office

F. H. McGraw & Co., New York City engineering and contracting firm, now has a western office in the Wasatch Oil Bldg., Salt Lake City.

yes, you can
Buy or Lease
this Universal
Concrete Pipe
Machine



★ You needn't lay out the purchase price to begin enjoying the production and profits of this great machine. Leasing arrangements are possible on terms that assure profitable operation. The Universal Pipe Machine has set new higher standards for efficiency. It makes more pipe and better pipe with fewer man hours. Because it true-tamps at the incredible rate of 680 strokes-a-minute, you use a drier mix, get stronger pipe that handles with less damage, requires minimum curing. One of the four sizes (5"-24", 6"-48", 12"-60", 24"-72") will meet your requirements. Ask about the *Universal Lease Plan*.

UNIVERSAL CONCRETE MACHINERY CO.
297 South High Street Columbus, Ohio



The Starrett No. 530 steel tape has a built-in tape hook which folds out of the way when not in use.

New Precision Tapes Have Special Features

A new line of precision case-type steel tapes has been introduced by The L. S. Starrett Co., Athol, Mass. The No. 530 Series features a 3/8-inch-wide tape line made of high-quality tape steel accurately etched with bright steel graduations on a no-glare black background. It is available in 25, 50, 75, and 100-foot lengths with quick-reading graduations in feet, inches, and eighths the entire length of the line. It also comes in metric or both English and metric graduations.

A special feature is the folding tape hook mounted on the ring at the end of the tape. The hook folds neatly out of the way when not in use. It enables anyone to use the tape without assistance and insures accurate measurement from the end of the tape ring when hooked over an edge or projection or inserted into a flat surface such as earth, lumber, etc. The tape is also equipped with a winding handle which folds flush into the case and is instantly released for use by a pushbutton on the opposite side of the case.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 321.

Little Precleaning For Anti-Rust Paint

A new line of products for painting rusty metal surfaces without extensive sandblasting or other costly cleaning methods has been developed by the Technical Coatings Division of McCormack-Medl Corp., Front and Kaighn Ave., Camden 3, N. J. These new Rustorize products consist of a special metal primer and a protective enamel top coat in various decorative colors and in aluminum. Tests show that it is necessary only to remove loose rusty scale with a wire brush before painting, the company states.

The metal primer is formulated from a specially treated fish oil with a high-quality pigment said to provide a waterproof, airtight, elastic film that stops and prevents further rust. Rustorize products can be brushed or sprayed on.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 398.

Head Safety Groups

J. B. Davies, Manager of the Industrial Department of Mine Safety Appliances Co., Pittsburgh, has been elected President for 1951 of the Veterans of Safety. Through its 700 members, including the country's outstanding safety engineers and accident-prevention authorities, the association assists the National Safety Council and other groups in solving new problems related to the field. It also encourages the teaching of safety engineering in technical and trade schools.

Dr. William P. Yant, Director of Research and Development for MSA, has been elected 1950-1951 President of the American Society of Safety Engineers. For the past three years he has been

Chairman of the Research Committee of President Truman's Conference on Industrial Safety. He is a director of the National Safety Council and Vice Chairman of that organization's Industrial Conference.

Rotary Power Sweeper

A 4-page bulletin describing a rotary power sweeper for construction or maintenance work has been issued by Standard Steel Works, North Kansas City, Mo. The unit is designed for sweeping bituminous roads before re-treatment and removing excess screenings from the base course prior to surfacing. It may also be used for general sweeping and snow removal if desired. The Standard Steel sweeper clears a path 73 inches wide at left and right angles up to 30 degrees. Illustrations of this unit in use and complete specifications are included in the folder.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 368.

VAN DORN POWER helps you Hammer Loose Tight Fastenings!



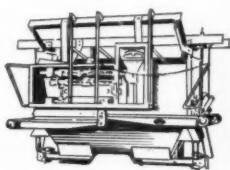
Van Dorn 3/4" Electric Impact Wrench is a handy tool for hammering stubborn fastenings loose or driving them home, in a few seconds—whether you use it for equipment maintenance or construction work! Delivers 2000 blows per minute. Handles nuts, bolts, cap screws. Weighs only 8 1/2 lbs. 1/2" square drive shank, perfectly balanced and easy to control. See your Van Dorn Distributor. Write for free catalog to: THE VAN DORN ELECTRIC TOOL CO., 787 Joppa Road, Towson 4, Md.

FOR POWER SPECIFY

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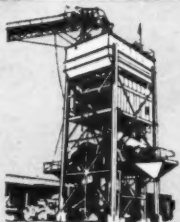
PORTABLE ELECTRIC TOOLS

(DIV. OF BLACK & DECKER MFG. CO.)



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New standards of accuracy and efficiency from a roadbuilders batcher to completely automatic, recording weighing batchers for high production ready mixed concrete operations.



CENTRAL MIXING PLANTS

BUTLER PLANTS are widely recognized as examples of brilliant engineering in a great variety of materials handling problems. Here the experience of the BUTLER Engineer is invaluable.



AGGREGATE PLANTS

Highly portable, quickly erected, BUTLER Aggregate Plants save time and money in meeting high pressure paving schedules.



CEMENT AERATOR

Compressor, engine, pump and complete controls all in one compact, space-saving unit. The BUTLER CEMENT AERATOR is essential to a smooth flow of cement.

TO GET THINGS DONE IN '51— SEE BUTLER BIN

1951 will be a year of action and unprecedented production. The highway program is expanding at an accelerated pace. Demand for Ready Mixed Concrete is climbing week by week for building construction is still far behind the nation's requirement.

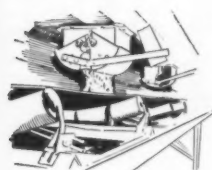
Production schedules such as these mean modern equipment—and modern equipment means BUTLER and BUTLER Engineered Design.

In your plans for new plants—or for modernizing existing equipment "to get things done in '51" it's the soundest of common-sense to consult the BUTLER engineer.

BUTLER BIN CO.

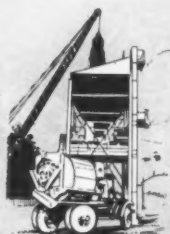
951 Blackstone Ave.,

WAUKESHA, WISCONSIN



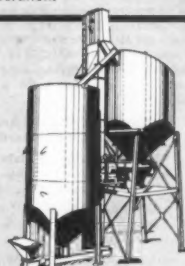
BUTLER BIN GATES

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Ready Mixed Concrete Plants for every production level—engineered by BUTLER for the highest efficiency and lowest cost operation.



BULK CEMENT PLANTS

A wide range of capacities for every roadbuilding job. Faster batching, split-pound accuracy. Shown is the CR-37-58 providing 650 bbls. capacity.



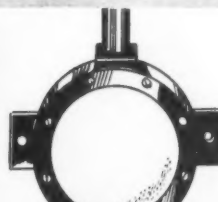
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BUTLER engineers have an international reputation for highly efficient design in Concrete Products Plants. BUTLER offers an engineering service that assures a maximum profit.



THE NEW BUTLER '102' SCOOP

Faster forward travel (11 miles an hour), a turning radius of only 6'3", the new BUTLER '102' is tops in maneuverability and efficiency.



BIN LEVEL INDICATOR

A new BUTLER development, a truly trouble-free, positive, accurate Bin-level Indicator. Works successfully with a great variety of materials.

Construction Outlook In This Year Ahead

(Continued from page 3)

the nature and scope of that work:

The river-and-harbor and flood-control program has been carefully screened, says General Pick, to comply with Presidential and Congressional defense criteria. With allocated funds of \$618,564,650, it is a little under the overall total of fiscal '50, but large multiple-purpose projects with provisions for hydroelectric power development top last year's allocations.

Flood control in the 1951 allocation receives \$430,527,150—\$366,660,250 for general flood control and emergency, \$61,850,400 for the Mississippi and its tributaries, and \$2,016,500 for California and the Sacramento River. Rivers and harbors receive \$186,142,500. Incidentals and a reserve for new projects account for the remainder of the total.

Here are the 20 largest individual construction allocations: Mississippi

River and its tributaries, \$46,800,000—McNary Lock and Dam in Oregon and Washington, \$39,389,100—Fort Randall Reservoir in South Dakota, \$31,455,000—Garrison Reservoir in North Dakota, \$29,969,000—Buggs Island Reservoir in Virginia and North Carolina, \$22,950,000—Wolf Creek Reservoir in Kentucky, \$22,000,000—Chief Joseph Dam in Washington, \$18,529,000—Clark Hill Reservoir in Georgia and South Carolina, \$17,000,000—Bull Shoals Reservoir in Arkansas and Missouri, \$16,272,000—Harlan County Reservoir in Nebraska, \$15,475,000—Detroit Reservoir in Oregon, \$15,167,100—Whitney Reservoir in Texas, \$13,745,000—Lookout Point Reservoir in Oregon, \$12,617,700—Chain of Rocks on the Mississippi River, \$8,500,000—Conemaugh River Reservoir in Pennsylvania, \$8,453,400—Pine Flat Reservoir in California, \$8,365,000—Mount Morris Reservoir in New York, \$7,500,000—Los Angeles County Drainage Area in California, \$6,575,000—Whittier Narrows Reservoir in California, \$6,500,000—central and southern Florida, \$6,300,000.

This civil-works program is being executed through the regular field organization of Division and District Engineers.

As for military work, General Pick advises that there will be a minimum of new construction in continental United States and a maximum of repair and rehabilitation of facilities already in existence. This repair and rehabilitation will be under the jurisdiction of the commanding generals of the six numbered armies in continental U. S. So address your inquiries about this kind of work to the respective Army Commanders, marked for the attention of "The Engineer".

New-construction funds appropriated for fiscal '51 amount to about \$180,000,000 for the Department of the Army and \$310,000,000 for the Department of the Air Force. The work will be in continental U. S. and at various overseas locations. A preliminary listing last November totaled \$209,000,000 for 210 projects in 24 states, the District of Columbia, Alaska, Bermuda, Hawaii, and Okinawa. Two-thirds of this first listing was for construction outside the U. S., principally in Alaska.

Actual work placement may be spread over a two or three-year period, but the Corps will try to execute most contracts before July, 1951. The entire military construction program will be handled through a selected list of Division and District Engineers, fewer than those handling the civil-works

(Concluded on next page)



George Von Kleinsmid Construction Co. of Bakersfield, Calif., uses an International TD-24 and a TD-18 to pull scrapers on a 3½-mile road being built up Mt. Pinos in Los Padres National Forest. The contract calls for the movement of 243,000 yards of rock and dirt. That's a 40 per cent grade the tractor is navigating.

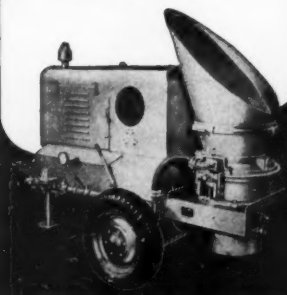
MONEY MAKER



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CONCRETE FASTER

"Welding with Concrete" best describes the new CMC JETCRETE method of pneumatically applying concrete. JETCRETE is the most nearly perfect concrete known today. Wherever and whenever used, JETCRETE has done the job better, faster—and at lower cost! The machine with a thousand uses!

- BUILDING . . . walls, roofs, partitions, fences, fire retardants, etc.
- REPAIRING . . . Disintegration of all kinds—old buildings, bridges, stacks, bunkers, dams, etc.
- WATERPROOFING . . . Reservoirs, tunnels, tanks, drains, fissures, water basins, etc.
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Write for illustrated bulletin No. 3G-348 showing JETCRETE in action.

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COMPANIES
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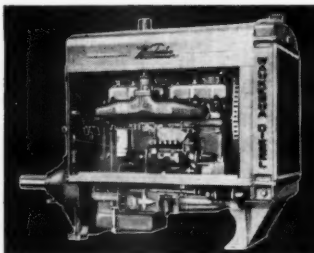


Waukesha *Diesel* POWER

• Quickly moved, and easily set up, to turn out a smooth uninterrupted flow of ¾-inch aggregate—100-125 cu. yds. an hour! This portable crushing, screening, loading plant is built by Highway Machinery Co., Waukesha, Wis. Its design emphasizes portability and power—Waukesha Diesel Power for capacity, dependability and low-cost operation.

This plant has a special 10½" x 36" Dual Jaw Primary Crusher, with Roll Secondary Crusher, 4' x 8' Triple Deck Screen, feeder, drum elevator, and conveyors—and all equipment is powered by the Model 148-DKU Waukesha Diesel. Yet it handles every load demand eagerly and easily with power to spare . . . burning its fuel cleanly, without smoking on the job. Economical, too . . . and easy to start. And neither flying dust nor dirt deter it in the least. Easy to understand and operate, this Waukesha Diesel is a contractor's engine.

Send for Bulletin 1414.



Model 148-DKU WAUKESHA DIESEL—Six cylinders, 5¼-in. x 6-in., 779 cu. in. displacement, 180 hp. maximum.

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program.

As things stand now, 60 to 75 per cent of the military projects will be performed by lump-sum contract after competitive bidding; they will be advertised by District Engineers, and interested contractors will have a chance to take part in the bidding. More negotiated lump-sum or cost-plus-a-fixed-fee contracts may be necessary later.

Usually, award to the successful bidder can be made by the Division or District Engineer without recourse to Washington; in some cases the Engineer will have to obtain approval of the award. Negotiated contracts, when used, may be negotiated by Division or District Engineers, or in the Office of the Chief of Engineers. In all cases, Division and District Engineers' recommendations of contractors will get full consideration.

It is a good idea, says General Pick, for contractors and architect-engineers to give information on their organization, background, and experience to each District Engineer with jurisdiction over areas in which they would like to work. The same data should go to the Office of the Chief of Engineers for the attention of the Assistant Chief of Engineers for Military Construction. If you have already filed such material, but it is not up to date, submit amended information soon.

Architects-engineers will be called in to design projects whenever adequate Government forces, technical facilities, and specialized skills are not available in the district. Experience in designing such projects, and the ability to organize sufficient personnel, will be the first criteria in selecting firms or individuals. Those in the general area of the project will be given preference where qualifications are satisfactory.

McClellan, of the USBR

The reclamation program for the rest of fiscal '51 has been cut, too, says USBR Chief McClellan. Some \$63,000,000 has been lopped off the original \$375,000,000 total. But since \$50,000,000 has been reserved for next fiscal year's program, the actual curtailment amounts to about \$13,000,000.

The program for the rest of the year, ending June 30, 1951, requires the start of new construction on 6 earthfill and 2 concrete dams, 200 miles of canals, 450 miles of laterals and pipe distribution systems, over 1,300 miles of transmission lines, 6 pumping plants, and one power plant.

On the Missouri River Basin Project: Work will start this spring on Anchor Dam, a concrete-arch structure near Thermopolis, Wyoming, and earthfill Bixby Dam near Faith, South Dakota. Major canals include 30-mile concrete-lined Angostura Canal near Hot Springs, South Dakota; a 10-mile reach of Cambridge Canal near Oxford, Nebraska; and 13 miles of Courtland Canal near Superior, Nebraska. Laterals will amount to 14 miles integrated with Courtland Canal, 36 miles on the Cambridge system, and 27 miles on the Superior system. A 520-mile-long transmission circuit will start in southeastern South Dakota.

On the Colorado-Big Thompson Project: Two earthfill dams will start up this spring—Willow Creek on the western slope of the Rockies near Granby, and Rattlesnake on the eastern slope near Loveland. Starts are scheduled on Flatiron Power and Pumping Plant; the 11-mile Saint Vrain Supply Canal; 13 more miles on Poudre and North Poudre Supply Canals, including a concrete weir-type diversion dam and 3 miles of tunnels.

On the Central Valley Project in California: Foundation excavation will start on Folsom Power Plant (the Corps will build Folsom Dam to create power potential). Specifications will be issued for fiscal '52 construction of Sly Park earthfill dam and a saddle dam, and for Camp Creek concrete diversion

dam, both near Camino, California. As Friant-Kern Canal nears completion, 370 miles of concrete pipelines are on the books for this year.

On the Columbia Basin Project in Washington: Grand Coulee Pumping Plant will be completed and the first pumping unit installed by this spring. New work includes a 17-mile reach of the East Low Canal near Quincy, Washington; 29 miles of Potholes East Canal near Othello; the 2-mile 14-foot-diameter Frenchman Hills Tunnel near Quincy; and the 5-mile Frenchman Hills Wasteway.

Hungry Horse Dam and Power Plant in Montana will approach 50 per cent completion by the end of this working season. Additional work this year: completion of the power-plant structure and installation of major electrical generating equipment.

On the Cachuama Project: Work placed under construction last year included Cachuama Dam, Tecolote Tunnel, and the South Coast Conduit. New work this year includes earthfill Lauro

and Glen Anne Dams.

Initial construction on the Eklutna Project in Alaska, which is to furnish power for the Anchorage area and agricultural regions of the Matanuska Valley, consists of the 4-mile 9-foot-diameter Eklutna Tunnel and 25 miles of transmission lines.

Needles, of the ARBA

The current national emergency, says

Colonel Needles, will have a tremendous effect on our highway system, already in critical state last June. By the end of last year, 48,500,000 motor vehicles were registered in the U. S.—practically one for every three residents. Yet even before events in Asia, the highways of our "motorized economy" were wearing out faster than new ones were being built.

(Concluded on next page)

We've got 'em . . . **TARPAULINS**

IMMEDIATE DELIVERY

Guaranteed new and first quality, 12 oz. per sq. yd. Grey Weight. With large rust-proof brass grommets.

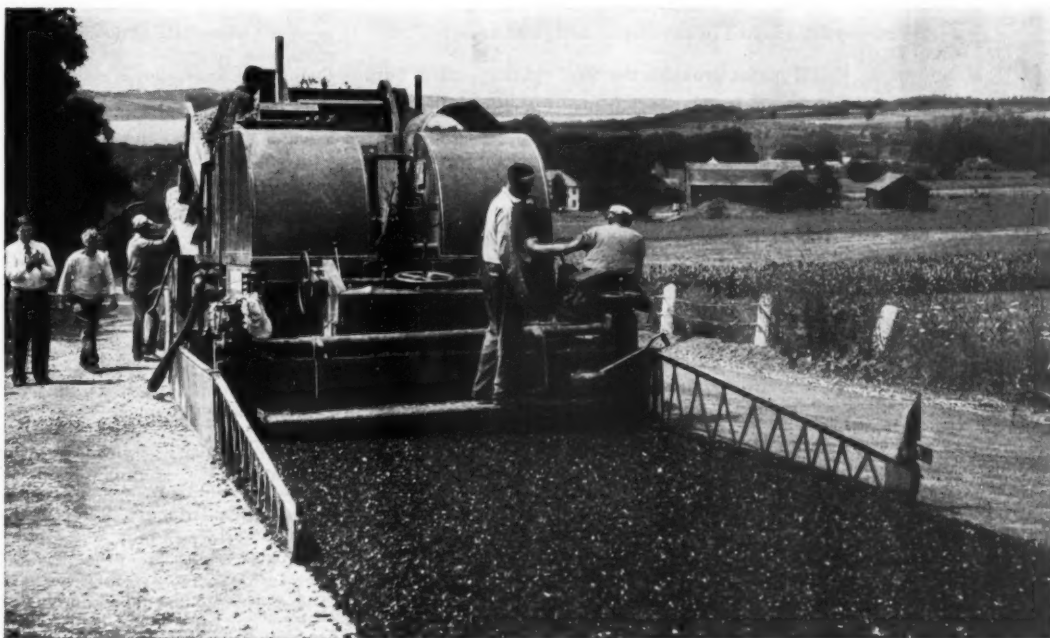
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H & B Moto-Paver Speeds the Job . . . Cuts the Cost

● The Moto-Paver makes road dollars go further, and do a better job. Especially on resurfacing and new construction on secondary roads and city streets. With the Moto-Paver, a uniform, high quality bituminous mat is mixed and laid—in one continuous operation. A smooth, waveless surface is produced, even when resurfacing over rough, irregular pavement. *No other machine or method produces comparable results at comparable costs.*

Moto-Paver uses beach sand, gravel, crushed stone or slag aggregates and various bituminous materials, including tars, cutback asphalts, road oils and emulsions. Road speeds up to 25 miles per hour make it possible to move the Moto-Paver from one job to another in a minimum of time.

The Moto-Paver is available in standard or heavy duty models for handling all types of resurfacing, retread and stabilization jobs under all kinds of conditions. See your local H & B distributor, or write for new bulletin MP-49.

HETHERINGTON & BERNER INC., Engineers-Manufacturers
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**H & B builds portable and stationary asphalt plants
of all types, sizes and capacities**



A Versatile, Flexible Machine

The aggregate may be dumped directly from trucks into Moto-Paver hopper, as shown here, or picked up from a windrow by using an H & B Moto-Loader with the Moto-Paver.

Construction Outlook In This Year Ahead

(Continued from preceding page)

The road construction program this year will, of necessity, be very different from a normal peacetime program. Tax money in '51 will go only for

highways. Road-construction materials and equipment are also defense-construction materials and equipment, so the supply of both will be tight. Highway contracting organizations are also, to notable degree, defense-construction organizations, so more and more of them will become identified with defense work as 1951 wears on. Bidding

will be difficult because of uncertainty as to wages, deliveries, controls, etc., further complicating the highway program, says Colonel Needles.

Under these conditions, new construction in 1951 will favor (1) expressways and major traffic arteries through areas of dense population and heavy traffic flow, and (2) access highways in defense areas. Maintenance will be crucial — maintenance, improvement, and reconditioning of existing key highways, and, in fact, of all highways.

"It appears more important than ever," says Colonel Needles, "that our normal maintenance program for all highways be pushed with the greatest possible vigor so that we will not lose the use of any part of our national network of highways, and so that we will be able to build on and expand our present system at such time as the current emergency is ended. . . . The vital thing is that we hold ourselves in readiness to serve our nation and to do best that job which may come to us for performance during 1951. Above all, we must be realistic, and do and build those things which will contribute best to the welfare of our nation. As we meet the immediate national needs, we must look forward to the future when the present emergency is ended. At that time, we must be prepared to move rapidly and effectively toward building a national highway system in keeping with our motorized economy."

Engineering Economy

A new text, "Engineering Economy", has recently been authored by H. G. Thuesen, P. E., Head of the School of Industrial Engineering and Management, Oklahoma A. & M. College. Mr. Thuesen points out in the preface to the book that engineering is essentially a means of obtaining desired results with economy, and the engineer's approach to the solution of problems has been so successful that his field of activity has broadened to the extent that his success now depends upon his ability to cope as much with economic aspects as with physical aspects of situations.

The book stresses that the purpose of engineering economy is to arrive at decisions of what action to take in the present that will prove fruitful in the future. Analyses are directed to evaluating the future economic effect of factors individually and in combination. The engineer who aspires to a creative rather than a responsive role will find proficiency in economic analyses a necessity, the author says. A similar proficiency is of paramount importance to the increasingly large number of engineers who eventually engage in management. This trend in employment is recognized by a quantitative economic approach to some aspects of management in Chapter 17, Economy and Utilization of Personnel.

In general, "Engineering Economy" aims to extend quantitative thinking to situations covering both engineering and economic factors. Numerous approaches and methods of analysis are presented, most of which are illustrated by concrete examples. Methods and concepts are in many cases illustrated

in graphic form. Many problems for solution are included to give the student practice in making analyses and to fix concepts and principles in his mind.

The new text is published by Prentice-Hall, Inc., 70 Fifth Ave., New York 11, N. Y. Price is \$6.65.

Death to Roadside Signs

Vermont is out after small privately owned signs on highway right-of-ways. Most of these signs, explained Chairman L. N. Brainerd of the State Highway Board, are the directional type and do not require a state license; the only control is to force them back outside the right-of-way, which, since World War II, has become a "battleground of privately owned signs" competing for the motorist's attention.

The Highway Department will make a survey of all these signs now inside state highway limits, and will give owners adequate notice to relocate them. Once outside the right-of-way, advertising signs are under the jurisdiction of the Secretary of State.

Save Fuel and Increase Production

Your asphalt plant will use less fuel and will give you greater production with Hopkins' low pressure burning equipment.

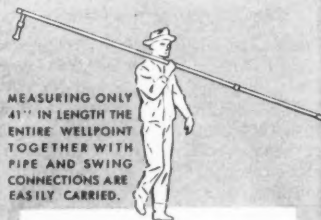
Time after time contractors have found that Hopkins' burners save them money, provide more efficient operation, and increase production. They are adapted to any size or design of dryer.

Hopkins provides the only "package unit" burner system for an asphalt plant. Write for literature.

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Burner Unit.

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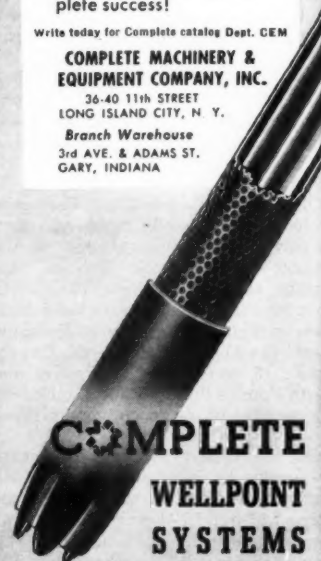
When you strike bad water conditions unexpectedly, call "Complete"! We're ready for emergencies—with the experience to supervise, the personnel to service, and the patented fluted tube Wellpoint to solve the worst of wet water conditions. Wherever it is possible to operate wellpoints, only "COMPLETE" gives Complete assurance of Complete success!

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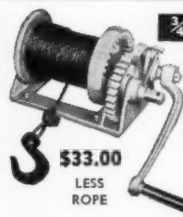
Whether your clutch problem involves overload, shock-load, load pick-up, engagement, speed, size, weight, torque, vibration dampening, adjustment, shaft length, drive, mounting or attachments — there is a ROCKFORD engineered-to-the-job CLUTCH that will prove right for your needs. ROCKFORD engineers will be glad to specify a type and size clutch that will save you power, space and final cost — upon receipt of a sketch or print showing your transmission requirements.

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3/4 TON WINCH

This Hand Winch is ideal for moving and installing heavy machinery, loading trucks, hand derricks, cranes, gin poles, loading logs, sawed lumber, loading implements on trailers, hoisting silage, pulling wells, etc. Can be bolted in any position. Made anywhere and operated of electric steel; bronze bushed; 2 speeds, 8.16 to 1 for heavy loads . . . 2 to 1 for fast operation . . . self

locking to hold loads at any position.
Overall Dimensions 12 1/2 in. x 7 1/2 in. x 7 in. Handle 10 in. long. Drum 3 in. dia. x 6 in. long x 6 in. dia. flanges. Will hold 100 ft. 3/4 in. Wire Rope. Illustrated with 50 ft. 3/4 in. Wire Rope. Shipping Wt. 37 1/2 lbs. GUARANTEE—Five-day return privilege.

\$43.45 WITH 50 FT. of 3/4 in. WIRE ROPE

Send remittance with order and we prepay postage. If your distributor doesn't have it for literature and information write:

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The self-propelled Hydra-Hammer is a kind of miniature pile driver with adapting tools for asphalt or concrete cutting, backfill tamping, post driving.

New Mobile Hammer Handles Various Jobs

The new self-propelled Hydra-Hammer is basically a miniature pile driver with adapting tools to enable it to do several types of work, according to Ottawa Steel Products, Inc., Industrial Division, Ottawa, Kans. An inexperienced man able to drive a car or truck can learn to operate the hammer efficiently in less than an hour, says Ottawa; it needs no tow truck, but gets to the job under its own power at road speeds up to 12 mph; and there is no lost time or motion for make-ready—the tower is elevated from travel position, gears are shifted, and the unit goes to work.

Because the 400-pound hammer is lifted by hydraulic energy but is free-falling, shock to operator and machine are said to be eliminated. The sliding tower works a 4-foot-wide trench or hole from side to side without any maneuvering of the wheels. The tool may be used for cutting or breaking asphalt or concrete, tamping backfill, driving posts, etc.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 294.

New Side-Dump Wagon

A new high-speed side-dump trailer has been announced by Athey Products Corp., 5631 W. 65th St., Chicago 38, Ill. Matched and designed for use with the new, recently announced Caterpillar DW20 diesel tractor, the Athey PD-20 wagon is constructed of high-strength steel and is of all-welded construction.

The design is a semi-bathtub type with modified tapered sides and one low side for loading and dumping. The body is dumped by hydraulic power supplied from the tractor, and the unit can be equipped to dump either to the right or to the left. The overall length of the tractor and trailer is 42 feet 5 1/2 inches; the width, 12 feet 2 1/2 inches; and the height, 9 feet 6 inches. The trailer has a wheelbase of 24 feet and a tread of 102 inches. The clearance under the frame is 24 3/4 inches.

The bottom of the wagon is constructed of double plate steel with oak fillers designed to absorb the shock of heavy shovel loading. Shock absorbers are rubber body pads similar to those used on the PD-10Q. Power is provided by the 4-wheel Caterpillar DW20 diesel tractor with the new 6-cylinder engine rated at 275-hp peak capacity. Travel speeds of the tractor and the PD-20



Athey's new PD-20 side-dump wagon is matched and designed for use with the new Caterpillar DW20 diesel tractor.

range from 2 to 20 mph.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 272.

Hand-Operated Shear Cuts Bars, Wire Rope

A manually operated hand shear for precision cutting of wire rope, flat bars, round bars, and varying shapes is announced by the Distributor Products Division of Watson-Stillman, Roselle, N. J. The weight of the shear body is distributed to get the balance needed for maximum cutting strength.

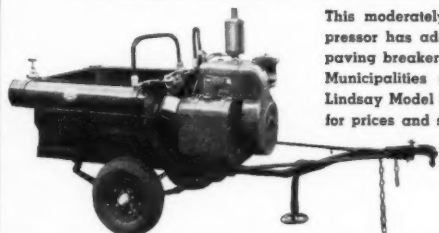
The body of the shear is regularly built of cast steel. Blades are made of hardened tool steel and shear cleanly. When used with the recommended blade, this hand shear cuts wire rope up to 1 1/2 inches in diameter, flat bars to 2 1/2 x 1 inch, and round bars up to 7/8 inch in diameter. Extra blades can be furnished for cutting different types and shapes of material. The blade can be changed quickly, says the company. The hand lever is shaped so that a pipe extension can be used for greater ease in cutting maximum sizes.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 386.

Tractors on Road Work

Two new folders on the construction and maintenance of roads have been prepared by the Industrial Power Division of International Harvester Co., 180 N. Michigan Ave., Chicago 1, Ill. The first, Form A-312-NN, contains pictures and stories of International

LINDSAY MODEL T-33 AIR COMPRESSOR



This moderately priced, really portable air compressor has adequate capacity to operate a light paving breaker or rotating rock drill. Contractors, Municipalities and Water Departments find the Lindsay Model 33 well suited to their needs. Write for prices and specifications.

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Light Weight
BUT HEAVY DUTY...

• ALL-ALUMINUM

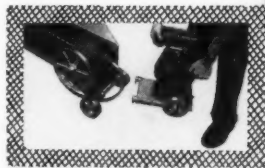
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• EASY ONE-MAN OPERATION

• HANDLES 1 TON PER MINUTE
(1-1/2 H. P. ENGINE)

FAIRFIELD
ALL-ALUMINUM
Utility Conveyor



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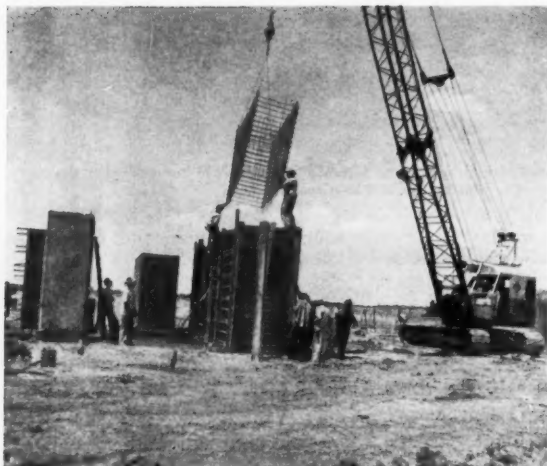
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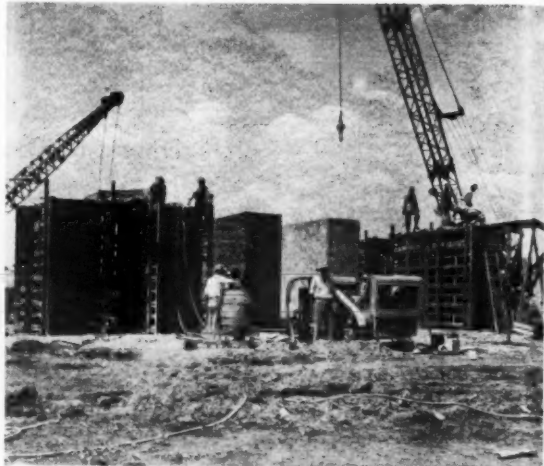
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Culverts Precast, Costs Cut

Box Culverts Precast in Central Yard Using Vacuum Process; Sections Hauled to Site and Lowered Onto Prepared Subgrade



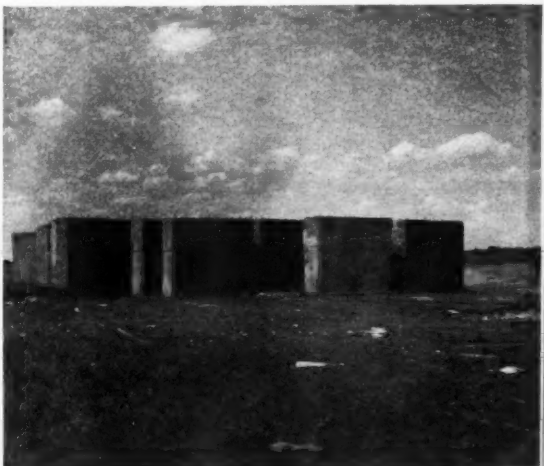
1. Some 333 culvert sections for a Dallas real-estate development were precast in this central yard by the Texas Construction Co., collaborating with Technic Engineering Co. and Vacon Products, Inc., all of Dallas. Here a reinforcing cage is lowered into a form.



2. A vacuum was applied in the inside through a special core or inside form designed by Vacon Products, Inc., southwest licensee of Vacuum Concrete, Inc. Suction was applied for 30 to 45 minutes after pouring was completed.



3. Then the special inside core was collapsed by the vacuum and lifted from the upright culvert section. Outside forms were left in place for about 1½ hours, then removed. After 6 more hours, the completed section was lifted from the casting platform . . .



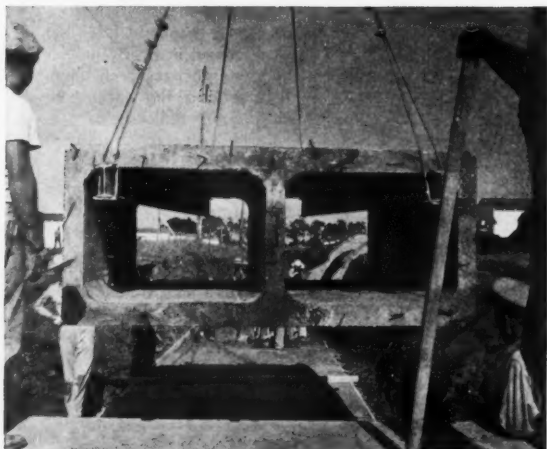
4. . . and placed in a curing yard where Hunt Clear Process curing compound was applied. Three sizes of culvert sections were constructed: double 3 x 6 cast in 8-foot lengths; double 5 x 3 in 10-foot lengths; and double 4 x 3 in 10-foot lengths.



5. At the placing site, to which they were transported on a 6-wheel truck, sections were lowered by a Northwest No. 6 crane into an open trench. The prepared subgrade of the trench consisted of a minimum of 2 inches of sand.



6. Notice the 6-inch space left between the two sections in the foreground. This will permit construction of a reinforced-concrete closure.



7. In this closeup of a double 3 x 4 section being lowered onto the sand cushion, note the reinforcing which protrudes from the ends for the reinforced-concrete closure—also the method of lifting. A small tractor and dozer handled subsequent backfilling.



8. A maximum of 32 sections was laid, grouted, and backfilled in an 8-hour day. The finished culvert meets City of Dallas spec, and costs were considerably lower than in the conventional method of pouring such sections in place monolithically. C. A. Didden, Vice President of Texas Construction Co., supervised all operations.

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War's Impact Felt At AASHO Meeting

Effect on Road Program Discussed by Highway Officials in
Miami; Transportation Problem Held Critical;
Anderson New President

♦ THUNDER on the Left out of Korea reverberated across the waters of Biscayne Bay at Miami, Florida, last month when the American Association of State Highway Officials held its 36th annual meeting. A grim and sobering keynote was struck in the major speeches as the four-day convention got under way on December 4. Highway officials from the various state departments and road commissions were warned bluntly of the transportation crisis that confronts this country as a result of the conflict in the Far East.

Before approximately 1,250 delegates and guests, gathered from all parts of the nation, Dewitt C. Greer, Texas State Highway Engineer and 1949 AASHO President, frankly declared that the group was faced with what looked like an "almost overwhelming problem". The Texan declared that the greatest deficiency in the road program was lack of adequate revenue to accomplish the improvements that are vital and necessary to the proper movement of traffic.

Succeeding Greer in office is James A. Anderson, Chairman, Virginia Department of Highways. In 1949 Gen. Anderson was selected to be First Vice President of the Association. Now 58, he has been Virginia's State Highway Commissioner since 1941. Anderson graduated from Virginia Military Institute at Lexington with top honors, and received his civil-engineering degree from Cornell University. He has been Town Engineer for Lexington, and a professor of civil engineering at V.M.I., where he later became head of that department. During World War I, Anderson rose to the rank of lieutenant colonel. In 1937 he became Dean of Faculty at V.M.I., a position that carried with it a brigadier-general's commission in the Virginia State Guard. During World War II, Gen. Anderson was coordinator of the State Defense Council.

Keynote

In the opening keynote address, Retiring President Greer stated that it is "most unfortunate that this country should be involved in war at all, and doubly unfortunate that we, in the highway field, were not able with the short time and limited funds available to us to bring our roads back to proper standards of construction and maintenance after the experience of World War II." He urged all state highway officials to be alert to dispersions and leaks in revenues such as underweight registration of trucks, illegal claims for gasoline-tax refunds, abuse of motor-vehicle reciprocity in the purchase of license plates, and similar practices. "Unless we do this," said Greer, "motor-vehicle users may rebel at fur-

ther taxation to be poured into a leaky barrel."

Greer recommended spending from 40 to 60 per cent of Federal-Aid highway funds on existing primary roads for what he termed "capital betterments" or "protection of investments". He went on to say that "the remaining funds should be utilized to push forward into some of our more advanced designs, on new locations and new right-of-way, which will be far from enough to even make a dent in the

needs but will provide some engineering advancements."

As to secondary-road programs, Greer likened them to a "leader" used by stores to bring in the customers in the hope they will make other and more expensive purchases. It is the popular program, he stressed, not only with the people but with state and national legislatures, and it is up to the road builders to make funds for secondary roads work to the best interest of the people. "I think we can create," said Greer, "more good public relations for state highway departments through a proper, well planned, carefully publicized, secondary-road program than by any other means."

For the relief of urban congestion, in Greer's opinion, available state and Federal revenues should be held under the jurisdiction of the state highway departments, "in order that they may be concentrated on a specific improvement until such improvement shall have been completed."

Again coming back to the subject of



The 1951 President of the AASHO—James A. Anderson, Commissioner, Virginia Department of Highways.

war, Greer touched on the possibility "that in the not too distant future we may have a more expanded type of war

(Continued on next page)

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War's Impact Felt At AASHO Meeting

(Continued from preceding page)

or mobilization that may bring to us more rigid restrictions in accomplishing our work." With this warning he urged the highway officials to place all available money, or money coming to them through legislation, "under the wheels of traffic in the immediate future".

War Talk

The threat of a major war, and its effect on our highways, was also emphasized on the opening-day program by the three major speakers, all from Washington, D. C. They were: Maj. Gen. Philip B. Fleming, Under Secretary of Transportation, U. S. Department of Commerce; Thomas H. MacDonald, Commissioner, Bureau of Public Roads; James K. Knudson, Member, Interstate Commerce Commission, and Administrator, Defense Transportation Administration.

Gen. Fleming pointed out that "a war economy will require that highways be kept in as good shape as the railroads and other transportation media." He reminded his listeners that "there will not be enough steel, or copper, or aluminum, for instance, to satisfy everyone—highways, pipelines, or railroads." Washington will endeavor, the General maintained, to place available resources where they will do the most good for the country and its defense. He declared that redesigning, to reduce or eliminate use of critical materials where feasible, should be the order of the day, and urged highway officials to make "scarce materials go as far as possible, and use as small amounts as are consistent with safeguarding necessary highway transportation."

As to the rapid increase in the number of heavily loaded vehicles using the highways, Fleming noted that highway officials are concerned over the possible damage that might be inflicted by axle loads above 18,000 pounds. He then brought up the test that several state highway departments, in cooperation with the U. S. Bureau of Public Roads and the Highway Research Board, have conducted on U. S. 301, south of La Plata, Md. This test project was designed to show the performance of a concrete pavement under action of commercial-type vehicles loaded to 18,000 and 22,400 pounds on single and 32,000 and 44,800 pounds on tandem axles.

"While no formal conclusions can be drawn until the project is completed", said the General, "both my own observations and interim reports by the Highway Research Board indicate to me that excessive loading does constitute a real threat to our highways in general and to the vitally important Interstate System in particular. Faced as we are with mounting traffic volumes and the urgent need to conserve and improve our highway network, we simply cannot afford the luxury of damaging axle weights which serve the aims of a very small minority of commercial operators."

Fleming also reviewed the newly announced policy of the Department of Defense concerning the movement of military materials along our highways, and predicted that it would "go far toward preventing any repetition of the confusion and uncertainty which size and weight limitations provoked during World War II."

MacDonald Speaks

In an hour-long speech Commissioner MacDonald warned of the two policies characteristic of the last war period that would be disastrous if repeated now. The first of these was the inclusion of highways in the order to cease construction unless certified by control authority, and the second was the disregard of state legal load limits, particularly axle-weight concentrations for military hauling or claimed military cargoes. These two policies were advanced on the theory of aiding the defense program.

"It is important that the policies to be adopted now shall be adjusted to existing conditions," said the Commissioner. "Those who carry the heavy responsibility of national policy have repeatedly stated the position that to keep the nation strong, the national production must be increased and the national income must be maintained at high levels."

MacDonald tied this statement up with the highway program by declaring that "To hold national income at current levels, it is necessary to hold transportation at the same levels. To increase national income, it will be necessary to increase transportation." With highways depreciating under heavy traffic as soon, almost, as they are placed in service, the Commissioner reminded, there are only two possibilities of saving them—"the first is maintenance, and the second is reconstruction to standards adequate for the

volumes and weights of the traffic expected. This means a balanced program of these two operations, which reasonably should be based on a 10-year period. At the rate of replacements of the obsolete roads under the control of the state highway departments, for the past two or three years as an average, it will require a period of 20 years to rehabilitate these systems."

Knudson of the Defense Transportation Administration foretold that in the event of another war we might be faced with sabotage and fighting in our own country, and experience the dislocations of crippling air attacks, thus creating a staggering transportation problem. He said that he would like to see better enforcement of loading laws

(Continued on next page)

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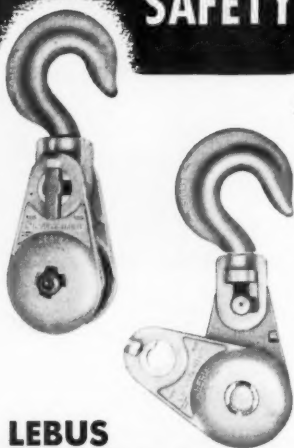
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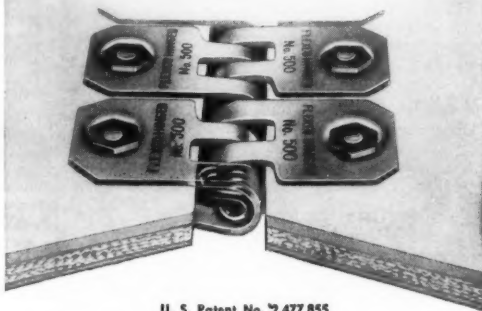
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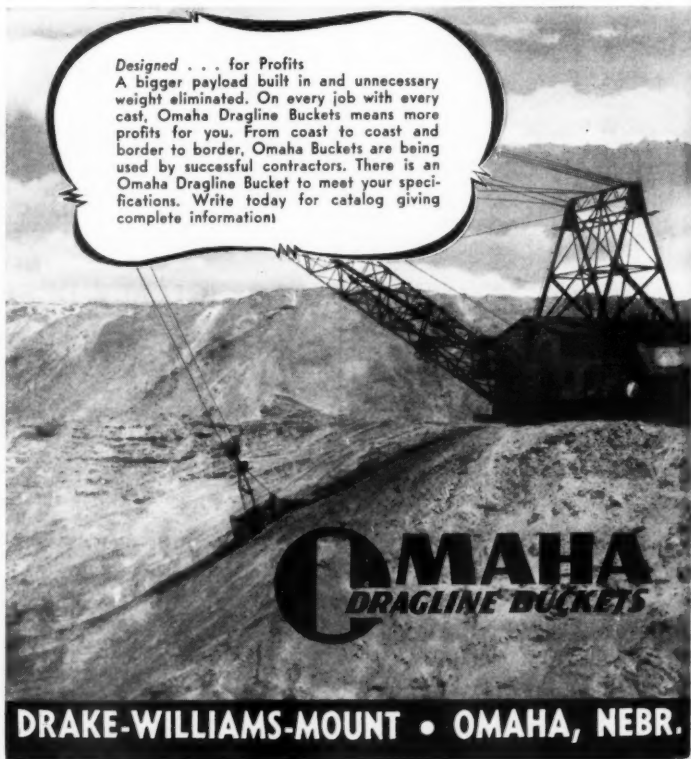
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in the states, and reminded the officials that Congress as late as August, 1950, refused to consider national legislation on this subject, even when it was tied to Federal aid. Knudson pleaded for uniformity in these laws, observing that in many states, regulations prevent the movement of vehicles and loads within the limitations recommended by the AASHO. He suggested a "recanvassing of existing load laws to determine whether any are artificial or unduly restrictive."

Awards

Part of the convention business included the conferring of awards. The George S. Bartlett Award, highest honor in the highway field, went to Robert H. "Sam" Baldock, Chief Engineer of the Oregon State Highway Department, and President of the AASHO in 1947-1948. Past presidents' testimonials were given to W. W. Polk of Illinois and C. W. Brown of Missouri. A total of 214 awards of merit for 25 years of service were passed out to various members of the association; this marks the sixth year such awards have been made, with over 1,800, all told.

After the opening-day session the convention got down to its customary business, with sixteen different committees holding forth on every aspect of highway affairs. The committees covered such activities as bridges and structures, materials, design, administrative practices, right-of-way, highway finance, factual surveys, construction, maintenance and equipment, secondary roads, traffic, legal affairs, uniform accounting, roadside development, public relations and publicity, and highway transport.

Blue-Book Boys

The paper that probably received the greatest amount of interest at any of the sessions was one entitled "Preventive Measures of a Highway Department in Stopping Leaks in Highway-User Revenue", by W. Hume Everett, Chairman, Wyoming Highway Commission, presented to the Committee on Administrative Practices. Calling Federal Aid a myth, Commissioner Everett charged that one of the greatest leaks in highway-user revenue occurs in the Federal government, which has collected, since the inception of the Federal gasoline and related user taxes, about four times as much as it has returned to the states by way of Federal Aid.

"Perhaps the greatest leak in highway-user revenue is brought about by inflation," Everett concluded. "The Government's attitude, actions, and inactions have helped to bring it about . . . Less Federal money spent for administrative purposes, red tape, and control will in the long run result in more miles of highway being built for the taxpayer on a more economical basis."

One of the examples of such leaks was connected with the term "blue-book boys" by which, according to Everett, Bureau of Public Roads engineers are sometimes unflatteringly referred to by contractors. "Only recently," he recalled, "two very reliable and responsible contractors told me personally (and with the assurance that their names would not be revealed) that all contractors bidding on any Federal-Aid work in our state added an arbitrary extra 10 to 15 per cent to their bids to take care of the frills, the hand raking of borrow pits, the stone polish-

ing, and other activities which cause them needless trouble and expense because of the unrealistic and arbitrary attitude of the 'blue-book boys'."

Leaks at the state level also came in for criticism by Everett when he scored direct and indirect diversion of highway-user revenue. Referring to National Highway Users Conference reports, the Wyoming highway chief stated that "Rhode Island is the principal offender, having diverted 46.2 per cent of its funds for nonhighway purposes. Other leaders were Florida with 36.8 per cent; Georgia, 36.2 per cent; Texas, 19.3 per cent; New York, 17.4 per cent; California and the District of Columbia, 15 per cent each."

Without naming names Everett declared that "Political corruption is also reflected in the administration and operation of some highway departments. In one state it has recently been said that the payroll of the highway department had been so loaded with so

(Concluded on next page, col. 3)

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War's Impact Is Felt At AASHO Meeting

(Continued from preceding page)

many political hangers-on that they got in the way of the bulldozers, graders, and construction equipment." He also charged that "In many cases employees are added to the department payroll without any consideration to experience or qualifications. In some states the spoils system still operates so that each time there is a change in elected officials there is a change in the department personnel. This has made for a lack of job security which has kept many competent, conscientious, and trained engineers from accepting employment with the department and causing others to leave at the first opportunity. I am proud to state that in Wyoming this is not the situation. Most of our engineers and skilled personnel have service records with us ranging from five to thirty years of continuous service."

Cooperation With Contractors

Cooperation with contractors was discussed at the Construction Committee session, with some highlights offered by A. N. Carter, Manager of the Highway Division, Associated General Contractors. He suggested that as much work as possible should be awarded at once, so that contractors can order necessary supplies and secure commitments as to delivery. Carter stated that the Joint Cooperative Committee, AASHO-AGC, favors the U. S. Bureau of Public Roads as claimant agency for materials if mobilization increases to the degree that a system of priority and allocation of construction supplies is required. The Committee further recommended that all highway departments study the use of a termination clause in their contracts having such major aims as to (1) make it legal for cancellation of the contract if war conditions dictate, and (2) provide that the termination be fair and equitable to all parties of the contract. Such clauses, according to the Committee, will result in better bids when projects are advertised, and use of the clause will be important in keeping prices down.

New Officers

In addition to electing James A. Anderson of Virginia as its new President, the Association selected Bert D. Talla-

my, Superintendent of the New York State Department of Public Works, as its First Vice President. New regional vice presidents also chosen are: Region 1—Ray F. Smock, Secretary, Pennsylvania Department of Highways; Region 2—A. E. Johnson, Chief Engineer, Arkansas State Highway Commission; Region 3—Ted J. Kauer, Director, Ohio Department of Highways; Region 4—J. R. Bromley, Superintendent, Wyoming State Highway Department. George H. Henderson, Principal Highway Engineer of the Rhode Island Department of Public Works, was re-elected Treasurer.

Three new members of the Executive Committee were elected—M. Allan Wilson, Chief Engineer, Delaware State Highway Department, for a one-year term expiring in 1951; R. A. Harris, Chief Engineer, Mississippi State Highway Department; and M. J. Hoffmann, Commissioner, Minnesota Department of Highways. Terms for the last two run until 1955.



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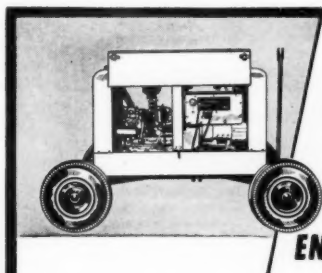
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Drop-Axle Assembly

A new drop axle which reduces the distance between spring center and track line to less than 8 inches has been developed by United Mfg. Co., 46 W. Interstate St., Bedford, Ohio. Designated Series 7129, this new Caravan unit employs underslung springs which augment the drop axle's low center of gravity. The 4-inch drop provides increased protection against overturning, the company says. In addition, the spring pad is an integral part of the axle assembly to eliminate the possibility of spring shift, as well as to increase overall axle strength.

This special design is recommended by United for use on utility trailers, portable welding generators, pole carriers, etc. The axle is capable of supporting loads of 4,000 or 5,000 pounds, depending upon beam diameter. Because of the cast drop assembly and specially designed connecting axle beam, track line can be supplied to user's specifications. The brake flange is incorporated as an integral part of the drop casting. The flange is machined to receive 12-inch mechanical or electrical brakes. Caravan axles are available with varying depths of drop and can be furnished equipped with brakes, wheels, and tires.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 303.

Littleford Founder Dies

John Spencer Littleford, founder of Littleford Bros., Inc., of Cincinnati, died last November at the age of 94.

In the 1870's, Mr. Littleford became associated with his grandfather in his small sheet-metal products company in Cincinnati. In 1882, he purchased a third interest in the firm, and ten years later he and his brother purchased the business in its entirety and changed the name to Littleford Bros., now one of the largest road-equipment and steel-fabricating plants in the middle west.

Mr. Littleford's son Roger is President of the company; his son John is Vice President and Secretary.

Announces New Welder

A new silicone-insulated, portable, ac welder, equipped with automatic Hot Start control, has been announced by the Welding Division of General Electric's Apparatus Department, Schenectady 5, N.Y. Known as 6WK30J Series, it is said to be one of the first commercially available standard ac welders incorporating silicone insulation. Since this insulation is water-repellent and resistant to high temperatures, it offers maximum protection for both operator and welder, and assures a high margin of operating dependability. The unit has a current range from 40 to 375 amps, and accommodates electrodes from 3/32 to 1/4 inch in diameter. The welder can be used for light or heavy materials. Mounted on a running gear, it can be easily moved.

Instant arc striking without manual adjustment is provided by Hot Start automatic control. The ampere range is covered by three overlapping current ranges which permit precise current control, G-E says. Coils of the welder, impregnated with Class H insulation, have been rated at the conservative temperature rise of 130 degrees C. The unit is 17 inches in diameter and 35 inches in height.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 393.

Broadcast Spreader

Roadside-development men will be interested in a new broadcast spreader designed to apply seed and fertilizer at the same time. This unit, manufactured by Ezee Flow Corp., 10 S. LaSalle St., Chicago 3, Ill., will sow grasses and legumes and any fertilizer, the company says.

The Ezee Flow universal seeder



The Ezee Flow spreader applies seed and fertilizer at the same time. It comes in 8, 10, and 12-foot models with capacities up to 2,000 pounds.

comes in 8, 10, and 12-foot models with capacities up to 2,000 pounds. Its features include Oil-Lite bearings that require no lubrication, tractor-seat control, 100 per cent gearing with no drive chain, and flexibility in seeding range. The exclusive cam agitator is said to

assure continuous, uniform spreading. The spreader will also handle sand, cinders, calcium chloride, and other chemicals.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 267.



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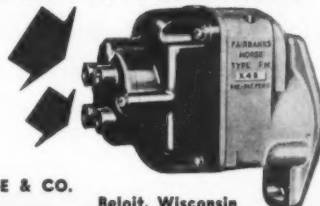
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Stubbie drill bits are designed for drilling holes for shields and anchors in concrete and masonry.

New Line of Short Concrete-Drill Bits

A new line of concrete-drill bits, known as Stubbies, has been announced by Concrete Termite Drill Co., 2082 Foothill Blvd., Pasadena 8, Calif. Stubbies are extra-short rotary drill bits especially designed for drilling holes for shields and anchors in concrete and masonry. They have an overall length of 4 inches, and come in sizes for drilling holes from 1/4 to 3/8 inch in diameter in increments of 1/16 inch.

Stubbies have shank diameters of 1/4 to 1/2 inch and may be used in electric drills, air motors, or in a hand brace. The inserts (cintered tungsten-titanium carbide for longer wear and abrasive resistance) incorporated in Stubbie bits penetrate concrete and masonry at high speeds, it is claimed. Inserts and drill are the same diameter. These new bits supplement the company's standard line

of rotary drill bits known as Concrete Termite and Core Termite.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 302.

Power-Driven Sprayer Feeds From Original Drum

Literature describing the Aeroil No. 622 power-driven sprayer, which is designed to apply asphalt emulsions or colorless concrete-curing materials directly from the shipping drum, has been offered by Aeroil Products Co., Inc., South Hackensack, N. J. It points out that this mobile spray unit will handle all liquids having a viscosity lighter than 115 furol at 77 degrees F. The use of the original drum, the folder points out, eliminates messy and time-consuming transfer of materials, and drums may be changed within 3 or 4 minutes. The machine is delivered complete and requires only materials to be sprayed and gasoline for the engine.

The literature illustrates the unit and offers recommendations for the method of operating. It also indicates the various liquid materials which the unit will and will not handle. All features and specifications are provided.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 373.

U. S. Rubber Notes

Joseph A. Conlon now manages allied sales for the Mechanical Goods Division of the U. S. Rubber Co., New York City. He was formerly District Sales Manager for the company's Chicago branch. Edwin D. Meade, formerly Manager of western railway sales, replaces Mr. Conlon.



This thread restorer, with a swing of 2 5/16 inches, works readily in close quarters.

New Thread Restorer Works in Tight Space

A thread restorer for reconditioning closely spaced studs and bolts that are battered, distorted, or rusted is made by Buckingham Mfg. Co., Inc., Binghamton, N. Y. Added to the company's line of four other types of thread restorer, it completes a range of sizes which take care of all ASME and SAE standard threads from 1/4 up to 4-inch diameters.

With a swing of 2 5/16 inches, it works in close quarters, particularly on cylinder heads of automotive, marine, diesel, and steam engines—also on wheel lugs, spring hangers, shafts, pipe.

Adjustable cutting jaws can be fitted by a twist of the handle to any male thread of 1/4 to 1-inch root diameter, either right or left-hand. The jaws may be engaged at the bottom of the threaded section, and turned out toward the top, leaving clean end threads in which nuts may be started and run down easily. No die sets are required for interchange for size or type of thread.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 384.

Lightweight Aggregates

An 8-page general brochure on Permalite lightweight aggregates is available from Great Lakes Carbon Corp., Building Products Division, 18 E. 48th St., New York 17, N. Y. It is separated into two main sections: one on lightweight plaster and the other on lightweight insulating concrete.

Each section consists of data on features, recommended mixes, and typical applications. The technical data cover complete mix-design information, including materials required per cubic yard, typical properties, and mix proportions by volume.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 340.

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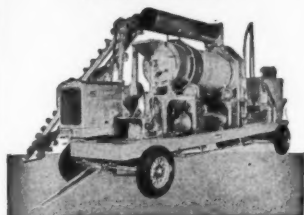
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